

2018

Greenhouse Gas Emissions from Soil Applied Nitrogen Fertilizers

Samuel Thies

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GREENHOUSE GAS EMISSIONS FROM SOIL APPLIED NITROGEN
FERTILIZERS

BY
SAMUEL THIES

A thesis submitted in partial fulfillment of requirements for the

Master of Science

Major in Plant Science

South Dakota State University

2018

GREENHOUSE GAS EMISSIONS FROM SOIL APPLIED NITROGEN
FERTILIZERS

SAMUEL THIES

This thesis is approved as a creditable and independent investigation by a candidate for the Master of Science in Plant Science degree and is accepted for meeting the thesis requirement for this degree. Acceptance of this does not imply that the conclusions reached by the candidate are necessarily the conclusions of the major department.

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ABBREVIATIONS

°C	degrees Celsius
CH ₄	methane
cm	centimeter
Control	no treatment added
CO ₂ -C	carbon dioxide-carbon
DAT	days after treatment
DCD	dicyandiamide
DFA	days following application
EEF	enhanced efficiency fertilizer
EF	emission factor
ESN	environmental smart nitrogen (polymer coated urea)
FFT	fast Fourier transformation
g	gram
g cm ⁻³	grams per cubic centimeter
g CO ₂ -C ha ⁻¹ hr ⁻¹	grams carbon dioxide-carbon emitted per hectare per hour
g ha ⁻¹ hr ⁻¹	grams per hectare per hour
g N ₂ O-N ha ⁻¹ Day ⁻¹	grams nitrous oxide-nitrogen emitted per hectare per day
g N ₂ O-N ha ⁻¹ hr ⁻¹	grams nitrous oxide-nitrogen emitted per hectare per hour
g NH ₃ -N ha ⁻¹ Day ⁻¹	grams ammonia-nitrogen emitted per hectare per day
g NH ₃ -N ha ⁻¹ hr ⁻¹	grams ammonia-nitrogen emitted per hectare per hour
GHG	greenhouse gas
kg	kilogram

$\text{kg CO}_2\text{-C ha}^{-1} \text{ Day}^{-1}$	kilograms carbon dioxide-carbon emitted per hectare per day
$\text{kg NH}_4\text{-N ha}^{-1}$	kilograms ammonium-nitrogen per hectare of soil
$\text{kg NO}_3\text{-N ha}^{-1}$	kilograms nitrate-nitrogen per hectare of soil
m	meter
m^2	square meters
mg	milligram
mg SOC gram^{-1}	milligram soluble organic carbon per gram of soil
mL	milliliter
N	nitrogen
NBPT	N-(n-butyl) thiophosphoric triamide (urease inhibitor coated urea)
$\text{N}_2\text{O-N}$	nitrous oxide–nitrogen
NH_3	ammonia
NH_4^+	ammonium
$\text{NH}_3\text{-N}$	ammonia-nitrogen
$\text{NH}_4\text{-N}$	ammonium-nitrogen
NO_3^-	nitrate
$\text{NO}_3\text{-N}$	nitrate-nitrogen
Picarro	Picarro Cavity Ringdown Spectrometer
PLFA	Phospholipid Fatty Acid
ppb	parts per billion
ppm	parts per million
PVC	Polyvinyl chloride
SOC	soil organic carbon

Start	initial values at beginning of experiment
SuperU	NBPT and DCD coated urea
$T_{ave, cool}$	average night time temperature
$T_{ave, heat}$	average daytime temperature
UAN	urea ammonium nitrate
Urea	treatment receiving urea
Urea + U	urea coated with urease enzyme inhibitor
Urea & Water	treatment receiving urea and supplemental irrigation
Water	treatment receiving supplemental irrigation
WFPS	water filled pore space

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ABSTRACT

GREENHOUSE GAS EMISSIONS FROM SOIL APPLIED NITROGEN

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Greenhouse gases (GHG) absorb and emit radiant energy in the thermal range. Their concentrations in the atmosphere are increasing and becoming an ever increasing issue as the Earth's average temperature continues to rise. Agricultural practices, such as applying nitrogen fertilizer to increase crop yield can be a major source of GHG emissions and methods are needed to decrease these emissions. The measurements of GHG emissions have been difficult, expensive, and erratic. However, advancing technologies have increased the accuracy and confidence in measuring GHG emissions. The objectives of this study were to determine the 1) effects of different nitrogen fertilizer sources, 2) application dates on greenhouse gas (nitrous oxide and carbon dioxide) and ammonia emissions and 3) sampling requirements and associated errors. Gas samples were collected and measured for 21 days following nitrogen fertilizer application every four hours. A polymer coated urea (Environmentally Smart Nitrogen, ESN), urease inhibitor (NBPT) coated urea, and urea fertilizer were used as the nitrogen fertilizer source and applied at a rate of 224 kg N ha^{-1} . Soil was sampled at the start and completion of each fertilizer application date for ammonium and nitrate concentrations and the microbial community was evaluated using the Phospholipid Fatty Acid (PLFA)

technique. The enhanced efficiency nitrogen fertilizers (urease coated urea and polymer coated urea) reduced nitrous oxide emissions but did not influence carbon dioxide or ammonia emissions. Fertilizer application date, fertilizer source, and application season had a large impact on greenhouse gas emissions. Applying urea fertilizer, regardless of season, increased ammonia and nitrous oxide emissions, but did not increase carbon dioxide emissions. In the fall, as soil temperature decreased, nitrous oxide and carbon dioxide emissions decreased; although, ammonia emissions was less influenced by soil temperature. The decrease in carbon dioxide and nitrous oxide emissions were attributed to decreasing microbial activity and nitrification rates. In the spring, the relationship between temperature and nitrous oxide emissions was less prevalent. Seasonal differences may have resulted from changes in the microbial community structure. Nitrous oxide results followed a similar trend to available nitrate detected in the soil (0 – 60 cm). Sampling for N_2O -N at average air temperatures resulted in underestimating emissions and different fertilizer application dates resulted in changes in variance structure. This study showed that GHG emissions could be reduced by applying enhanced efficiency nitrogen fertilizers (urease coated urea and polymer coated urea) and adjusting the fertilizer application date.

Chapter 1: Polymer Coated Urea (ESN) and Urease Inhibitor Coated Urea (NBPT)

Reduced Nitrous Oxide Emissions Following Application

1.1 ABSTRACT

It has been theorized that enhanced efficiency fertilizers (EEF) are effective in reducing nitrogen (N) losses through ammonia volatilization and nitrous oxide emissions. This project was designed to determine if EEF are effective in decreasing nitrous oxide, carbon dioxide, and ammonia gas emissions when compared to a conventional urea fertilizer. Furthermore, few experiments have assessed multiple GHG emissions simultaneously. Therefore, this study used three different N fertilizer products [Urea, polymer-coated urea (environmentally smart nitrogen, ESN), urea coated with a NBPT urease inhibitor (Urea + U)]. Furthermore, this study was conducted in the laboratory at an air temperature of 23°C and it contained two N rates (0 and 224 kg N ha⁻¹). Nitrous oxide, ammonia volatilization, and carbon dioxide emissions were measured every four hours for a period of 20 days following fertilizer application. Over the study period, Urea had higher N₂O-N emissions than ESN, Urea + U, and the no-fertilizer treatments. Ammonia volatilization and carbon dioxide emissions differences were not detected among the fertilizer sources. These findings indicate that ESN and Urea + U were effective in reducing N₂O-N emissions when compared with Urea.

1.2 INTRODUCTION

Agriculture contributes about 6% of global greenhouse gas (GHG) emissions (Greenhouse Gas Working Group, 2010) of which nitrous oxide contributes 64% of these emissions (Larsen et al., 2007). Some management strategies to reduce N₂O emissions include applying EEF, delaying when the nitrogen fertilizer is applied, and multiple applications of the nitrogen fertilizer. Enhanced efficiency fertilizers are defined as “fertilizers that reduce N losses to the environment and/or increase nutrient availability when compared with conventional fertilizers.” (Olson-Rutz et al., 2009). Some commonly used nitrogen EEF’s include: polymer coated urea (ESN), urease and nitrification inhibited urea (NBPT), and urea ammonia nitrate (UAN) mixed with urease and nitrification inhibitor.

Several studies compared nitrous oxide emissions from urea and EEF’s. However, these studies have conflicting findings with nitrogen based EEF’s in conventional tillage with some studies reporting EEF reduced nitrous oxide emissions (Halvorson and Del Grosso, 2013) and others reporting that EEF did not reduce nitrous oxide emissions (Halvorson et al., 2014; Parkin and Hatfield, 2014). Nitrification and hydrolysis inhibitors affect different components of the N cycle. Nitrification inhibitors reduce the conversion of ammonia to nitrate, whereas hydrolysis inhibitors slow the hydrolysis of the urea molecule. Slowing urea hydrolysis can reduce ammonia volatilization (Clay et al., 1990a) whereas theoretically slowing nitrification has the potential to increase ammonia volatilization. Nitrous oxide is emitted during multiple steps on the N cycle; it is likely that depending on the local conditions, EEF can have different impacts on emissions. Clay et al. (1990b) reported that the nitrification

inhibitor, dicyandiamide (DCD) reduced ammonia volatilization from bare soil but did not reduce volatilization from residue covered soil, and the hydrolysis inhibitor NBPT reduced volatilization in both residue and bare soil. In both the bare and residue covered soil, losses were not instantaneous but peaked three days after the application of the nitrogen fertilizer sources. Burzaco et al. (2013) reported that the nitrification inhibitor nitrapyrin reduced nitrous oxide emissions from 2.34 to 1.77 kg N ha⁻¹, and that pre-emergence N had 22% lower losses than side dressed N. Woodley et al. (2018) reported that UAN treated with a urease inhibitor increased N₂O emissions by 17.3% when compared to UAN. Halvorson and Del Grosso (2013) reported that nitrous oxide emissions were reduced by 1.48 to 1.74 times when comparing polymer coated urea and urea treated with nitrification and urease inhibitors. With an inconsistency in findings, the objective of the study was to determine if ESN and NBPT coated urea reduced nitrous oxide, ammonia gas, and carbon dioxide emissions in a controlled environment when compared to urea.

1.3 MATERIALS AND METHODS

Experimental design

A laboratory study was conducted under controlled conditions with the ambient air temperature around 23 °C (±1 °C). The soil was a Brandt silty clay loam (fine-silty, mixed, super-active, frigid Calcic Hapludolls) (Soil Survey Staff, 2018) of which the top 15 cm of soil was collected using shovels following corn (*Zea mays*) harvest in November of 2017. The soil contains approximately 28, 65, and 7% clay, silt, and sand, respectively. The surface 15 cm soil depth contains approximately 36 Mg SOC-C ha⁻¹. Additional information on this soil is available in Kim et al. (2008) and Clay et al. (1995,

1996, 2015). Air dried soil was mixed, and large, greater than two cm in length, pieces of residue were removed. The soil was loosely placed in 20.3 cm diameter Polyvinyl chloride (PVC) rings that were ten cm in height. Each ring received 2350 grams of air dry soil followed by the application of the treatment which was covered with an additional 200 grams of air dry soil with the total soil mass at 2550 grams of air dry soil. This resulted in an eight cm total soil depth with one cm of soil on top of the treatments. The moisture content of the dry soil was $0.11 \text{ g water (g dry soil)}^{-1}$. The soil in the PVC rings had an average bulk density of 0.84 g cm^{-3} ; field bulk density at collection was 1.29 g cm^{-3} for the 15 cm depth. Following application of the treatment, 500 mL of water was added to the soil in each PVC ring. Additional water (200 mL) was added every 3-4 days depending on soil moisture conditions of the PVC rings.

Treatments

The treatments consisted of three different nitrogen fertilizer sources applied at 224 kg N ha^{-1} along with a Control, which received no additional nitrogen fertilizer. The fertilizer treatments were Urea, urea coated with Factor® (Rosen's Inc., Liberty, MO), which is the urease inhibitor (NBPT, N-(n-butyl) thiophosphoric triamide), (Urea + U), and a polymer coated urea (ESN, environmental smart nitrogen) (Agrium U.S. Inc., Loveland, CO). The Urea + U treatment was urea coated with the urease inhibitor at the rate of $3.40 \text{ mL Factor}^{\circledR} \text{ kg}^{-1} \text{ urea}$. Factor® and ESN are listed as trade names for reference and the author does not endorse the product. Treatments were placed in a randomized complete block design. Since only eight LI-COR LI-8100-104 chambers were available for analysis, only two blocks could be analyzed at a time for the 20 day analysis period. The remaining two blocks were analyzed following the completion of

the first set of two blocks. The difference between the two analysis periods was considered minimal due to a controlled indoor environment with air temperature held constant for all blocks.

Gas Sampling Protocol

A LI-COR LI-8100-104 Long-Term Chamber (LI-COR, Lincoln, NE) was placed on top of each PVC ring according to LI-COR protocol. The chambers automatically sampled one at a time in a designated sequence, mixed the air in the chamber, and the air that was analyzed was returned to its respective chamber. Samples were collected for 15 minutes every four hours, this resulted in six readings per chamber per day. The gas samples were transferred through plastic hoses to the LI-COR LI-8150 multiplexer (LI-COR, Lincoln, NE). During each chamber closing, gas samples were collected and analyzed every second for CO₂ using a LI-COR LI-8100A Automated Soil CO₂ Flux System (LI-COR, Lincoln, NE). The gas samples were then transferred through a sampling harness to the Picarro Cavity Ringdown Spectrometer (Picarro) (Picarro Inc., Santa Clara, CA). The Picarro measured the gas samples for N₂O, CO₂, and NH₃. Nitrous oxide and CO₂ were measured at parts per million (ppm) and NH₃ was measured at parts per billion (ppb). Soil emissions were collected for 20 days which started on the day of treatment application.

Calculation of Flux

The Picarro measured the gas samples at one second intervals for fifteen minutes. This resulted in 900 readings per chamber closing. Flux was calculated using LI-COR SoilFluxPro™ software (ver 4.0.1) (LI-COR, Lincoln, NE). Corrections were applied individually for the collar offset from the PVC base on each of the eight LI-COR LI-

8100-104 chambers. Flux was then calculated from 45 to 900 seconds after chamber closing for N₂O, and NH₃, and from 45 to 165 seconds following chamber closing for CO₂.

Soil Analysis

One soil sample was collected before treatments were applied in each block. Also, a soil sample was collected after completion of the 20 day analysis period in each individual chamber. Soil samples were collected using a hand trowel. When the samples were collected, it was noticed that the fertilizer materials were still visible in the soil sample. The fertilizer materials were dried and ground together with the rest of the soil sample to pass through a two mm sieve in preparation for ammonium and nitrate analysis (Clay et al., 2005).

Data Analysis

Nitrous oxide and ammonia emissions were multiplied by 0.636 and 0.822, respectively, to represent N emissions and carbon dioxide was multiplied by 0.273 to represent carbon (C) emissions. Therefore, emissions for N₂O are described in terms of N₂O-N, emissions for NH₃ are described in terms of NH₃-N, and emissions for CO₂ are described in terms of CO₂-C. The six individual measurements that occurred within a day were summed and units are represented in grams ha⁻¹ day⁻¹ for N₂O-N and NH₃-N and kg ha⁻¹ day⁻¹ for CO₂-C.

The model used for a randomized complete block design is the following:

$$y_{ij} = \mu + \alpha_i + \beta_j + \varepsilon_{ij}$$

where y_{ij} is the mean emissions of the β^{th} block of the α^{th} treatment, μ is the grand mean, α_i is the fixed effect of treatment i for $i=1,2,3,4$, β_j is the effect of block j for $j=1,2,3,4$, and ε_{ij} is the random error effect.

The ANOVA function in R (ver 3.4.3) (R Core Team, 2017) was used to determine treatment differences. If the p-value was less than α of 0.05, a Fisher LSD was conducted using the agricolae (de Mendiburu, 2009) package in R. The data analysis was similar for the four 5-day average daily emissions except the dataset was reduced to the five day emissions in question.

1.4 RESULTS

Soil Test Results

Soil samples were collected at the start of the experiment and the average values were; 5.25 pH, 2.49 kg NO₃-N ha⁻¹ and 0.82 kg NH₄-N ha⁻¹ (Table 1.1). Urea + U had higher NO₃-N soil test results of 406 kg ha⁻¹, which was followed by Urea, ESN, and the Control with 237, 167, and 3.47 kg NO₃-N ha⁻¹, respectively (Table 1.1). Urea + U also had the highest NH₄-N soil test results of 20.3 kg ha⁻¹ which was followed by ESN, Urea, and the Control treatments with results of 16.65, 12.81, and 0.72 kg NH₄-N ha⁻¹, respectively (Table 1.1).

ESN and Urea + U did not lower soil NO₃-N or NH₄-N when compared to the Urea treatment. Urea + U actually had higher NO₃-N and NH₄-N soil test results of 406 and 20.3 kg ha⁻¹, respectively, when compared to the Urea treatment which had NO₃-N and NH₄-N results of 237 and 12.8 kg ha⁻¹, respectively. The reason Urea + U had higher soil test values than the applied rate of 224 kg N ha⁻¹ is unknown. These results suggest

that after 20 days, most of the urea had been hydrolyzed and nitrified. Higher ammonium and nitrate concentrations were attributed to the hydrolysis inhibitor slowing N_2O -N loss.

ESN soil test's results for $\text{NO}_3\text{-N}$ or $\text{NH}_4\text{-N}$ were similar to Urea. These results were attributed to the polymer coating which slowed N release from the granule. Slowing the rate that nitrogen is released from the fertilizer granule should lower soil ammonium and nitrate levels. All fertilizer treatments had higher $\text{NO}_3\text{-N}$ and $\text{NH}_4\text{-N}$ soil test results than the Control treatment which had results of 3.47 and 0.72 kg ha^{-1} , respectively. From the soil test results, we can conclude that Urea + U and ESN did not decrease the amount of plant available nitrogen 20 days following fertilizer application when compared to the Urea treatment.

All treatments had lower pH when compared to the starting pH value of 5.25 after 20 days. The Urea treatment had the lowest pH of 4.80 which was followed by Urea + U, ESN, and the Control with pH values of 4.89, 5.05, 5.16, and 5.16, respectively. The pH decreases were attributed to nitrification.

Table 1.1: Soil test results for pH, NO₃-N, and NH₄-N for both the initial (start) and completion of the 20 day analysis period, nitrogen fertilizer was applied at 224 kg N ha⁻¹.

Treatment	pH	NO ₃ -N	NH ₄ -N
		-----kg ha ⁻¹ -----	
Start	5.25a†	2.49c	0.82c
Urea	4.80e	237b	12.8b
Urea + U	4.89d	406a	20.3a
ESN	5.05c	167b	16.7ab
Control	5.16b	3.47c	0.72c
p-value	<0.001	<0.001	<0.001
Urea + U = NBPT coated Urea, ESN = Environmentally Smart Nitrogen values within a column that have the same letter are not significantly different at $\alpha = 0.05$			

Nitrous Oxide Emissions

Average N₂O daily emissions were separated into four 5-day time periods. In the Urea, ESN, and Control treatments N₂O-N emissions increased from the start of the experiment to 15 days after treatment (DAT), but a decrease in N₂O-N emissions was noticed in the 16-20 DAT time period (Table 1.2). In the Urea + U treatment, emissions increased as time progressed across all days. This data suggests that N₂O-N emissions peaked between 11 and 15 DAT for Urea, ESN, and the Control treatments. However, Urea + U did not reach its peak N₂O-N emissions during the 20 day study period. The Urea treatment had the highest average daily N₂O-N emissions. These results suggest that enhanced efficiency nitrogen fertilizers can reduce N₂O-N emissions in laboratory conditions.

When evaluating the temporal relationship between sampling period and losses, Urea and Urea + U had the highest N₂O-N emissions for the first ten days after treatment, however, emissions from Urea increased during the final two time periods. Urea mean

emissions increased from 4.75 and 5.11 g N₂O-N ha⁻¹ in the first ten DFA's to 23.3 and 18.0 g N₂O-N ha⁻¹ during 11 to 20 DAT (Table 1.2). The mean N₂O-N emissions from Urea + U remained relatively constant throughout the study with 5.45, 6.15, 6.79, and 7.34 g N₂O-N ha⁻¹ day⁻¹ during 1-5, 6-10, 11-15, and 16-20 DAT, respectively. ESN always had lower mean emissions than Urea and Urea + U except for 6-10 DAT when ESN was similar to Urea and 16-20 DAT when ESN was similar to Urea + U. ESN also had higher mean emissions than the Control treatment except during the first five days after treatment when ESN was similar to the Control treatment. Overall, Urea had the highest mean N₂O-N emissions which was followed by ESN, Urea + U, and ended with the Control treatments with 20 day mean emissions of 12.8, 6.74, 6.43, and 1.94 g N₂O-N ha⁻¹ day⁻¹, respectively.

Table 1.2: Mean N₂O-N emissions for the 20 day analysis period (All) along with mean N₂O-N for the four 5-day time periods, nitrogen fertilizer was applied at 224 kg N ha⁻¹.

Treatment	Mean Emissions				
	1-5 DAT	6-10 DAT	11-15 DAT	16-20 DAT	All
	-----g N ₂ O-N ha ⁻¹ day ⁻¹ -----				
Urea	4.75a†	5.11ab	23.3	18.0a	12.8a
Urea + U	5.45a	6.15a	6.79	7.34b	6.43b
ESN	2.22b	3.60b	14.8	6.39b	6.74b
Control	1.86b	1.61c	2.55	1.76c	1.94b
p-value	<0.001	<0.001	0.232	<0.001	0.002
Urea + U = NBPT coated Urea, ESN = Environmentally Smart Nitrogen, DAT = days after treatment					
†values within a column that have the same letter are not significantly different at $\alpha = 0.05$					

Ammonia Emissions

Ammonia-nitrogen emissions remained relatively low until the 16-20 DAT time period. On the average, daily $\text{NH}_3\text{-N}$ mean emissions decreased as time progressed except for 16-20 DAT when there was a drastic increase in mean $\text{NH}_3\text{-N}$ emissions. The mean daily $\text{NH}_3\text{-N}$ emissions for all treatments were 7.95, 6.76, 3.49, and 30.9 g $\text{NH}_3\text{-N}$ ha^{-1} for 1-5, 6-10, 11-15, and 16-20 DAT, respectively. The factor responsible for the increase in emissions from 11-15 to 16-20 days remains unknown to the author.

Table 1.3: Mean $\text{NH}_3\text{-N}$ emissions for the 20 day analysis period (All) along with mean $\text{NH}_3\text{-N}$ for the four 5-day time periods, nitrogen fertilizer was applied at 224 kg N ha^{-1} .

Treatment	Mean Emissions				
	1-5 DAT	6-10 DAT	11-15 DAT	16-20 DAT	All
	-----g $\text{NH}_3\text{-N}$ ha^{-1} day $^{-1}$ -----				
Urea	8.15	3.80	2.53	28.5ab†	10.7
Urea + U	12.6	7.05	2.93	9.15b	7.93
ESN	8.58	9.23	4.26	38.6a	15.2
Control	2.46	6.97	4.22	47.4a	15.3
p-value	0.554	0.831	0.953	0.025	0.386
Urea + U = NBPT coated Urea, ESN = Environmentally Smart Nitrogen, DAT = days after treatment					
†values within a column that have the same letter are not significantly different at $\alpha = 0.05$					

Carbon Dioxide Emissions

Over the course of the study, Urea + U had the highest CO₂-C mean emissions of 14.6 kg ha⁻¹ day⁻¹ which was higher than Urea, ESN, and the Control treatments which had mean emissions of 11.2, 12.1, and 10.4 kg CO₂-C ha⁻¹ day⁻¹, respectively (Table 1.4). Carbon dioxide emissions were highest in the 1-5 and 6-10 DAT time intervals regardless of the treatment (Table 1.4). Urea + U had the highest mean CO₂-C emissions at 1-5 DAT with 26.8 kg CO₂-C ha⁻¹ day⁻¹ which was followed by Urea, ESN, and the Control treatments with 20.4, 17.3, and 14.6 kg CO₂-C ha⁻¹ day⁻¹, respectively (Table 1.4). On the 6-10 DAT time interval, Urea + U once again had the highest CO₂-C emissions at 12.8 kg CO₂-C ha⁻¹ day⁻¹ which was similar to the ESN treatment with emissions of 12.3 kg CO₂-C ha⁻¹ day⁻¹ (Table 1.4). Mean emissions from the Urea + U and ESN treatments were greater than the Urea and Control treatments which had CO₂-C emissions of 8.9 and 9.8 kg CO₂-C ha⁻¹ day⁻¹, respectively (Table 1.4). In the 11-15 DAT and 16-20 DAT time intervals, treatment differences were not detected and CO₂-C emissions levels were lower than in the previous ten days.

Overall, CO₂-C mean emissions were highest and significantly different in the first ten days of the study and emissions decreased towards the end of the study. Since the highest emissions occurred in the first ten days, it is unknown if the increase in emissions was due to the nitrogen fertilizer application, which stimulated microbial growth, from enhanced microbiological growth resulting from soil drying and rewetting, or from the mixing of the soil. It is likely is a combination of all factors involved to produce these results.

Table 1.4: Mean CO₂-C emissions for the 20 day analysis period (All) along with mean CO₂-C for the four 5-day time periods, nitrogen fertilizer was applied at 224 kg N ha⁻¹.

Treatment	Mean Emissions				
	1-5 DAT	6-10 DAT	11-15 DAT	16-20 DAT	All
	-----kg CO ₂ -C ha ⁻¹ Day ⁻¹ -----				
Urea	20.4b†	8.88b	7.98	7.43	11.2b
Urea + U	26.8a	12.8a	9.97	7.86	14.4a
ESN	17.3bc	12.3a	10.2	8.66	12.1b
Control	14.6c	9.83b	9.11	8.04	10.4b
p-value	<0.001	<0.001	0.102	0.123	0.001
Urea + U = NBPT coated Urea, ESN = Environmentally Smart Nitrogen, DAT = days after treatment					
† values within a column that have the same letter are not significantly different at $\alpha = 0.05$					

1.5 DISCUSSION

Nitrous oxide emissions generally increase with increasing nitrogen fertilizer rates (Halvorson et.al, 2014). The objective of EEF's is to reduce N₂O emissions without negatively affecting crop performance. Crop performance can be negatively affected by the lack of synchronization of EEF's and plant uptake requirements. For example, ESN is designed to slowly release N and to match crop nitrogen demand to minimize N losses. In a three year-study, Parkin and Hatfield (2014) reported that 20 days following fertilizer application N₂O emissions were similar between their treatments; however, as the growing season progressed, significant differences were noticed. In our study, significant differences between the treatments occurred within the five days following application. Over 20 days, Urea had the highest N₂O-N emissions and it was significantly greater than the Urea + U, ESN, and the Control treatments. Differences between our study and Parkin and Hatfield (2014) were attributed to temperature differences. Our study was

conducted at a constant air temperature of 23 °C whereas Parkin and Hatfield's (2014) study was conducted outside in the spring when temperatures were much cooler.

Gao et al. (2015) reported that the effectiveness of EEF's is likely due to environmental factors, when nitrogen was applied to a warmer and wetter soil it increased urease and hydrolysis activity, thus resulting in higher N₂O-N emissions than in cooler and drier soils. Clay et al. (1990a) reported that N losses are highest when soil is drying and temperatures are at a maximum. Drury et al. (2017) reported that urea treated with a urease inhibitor had higher N₂O emissions than untreated urea and urea treated with urease and nitrification inhibitors. In Colorado, ESN had no significant difference on conventionally tilled soils but in no-till and strip-tilled soils, N₂O emissions were reduced (Halvorson et al., 2010). Halvorson and Del Grosso (2013) reported that Urea had the highest N₂O emissions which were followed by polymer coated urea and SuperU (NBPT and DCD coated urea). These studies had similar results to this study which showed Urea having the highest emissions which was followed by a polymer coated urea; in our case we used ESN. However, the effect of different soil moisture regimes on the effectiveness of EEF's in reducing nitrous oxide emissions needs further examination.

Carbon dioxide emissions from nitrogen fertilizer application are variable (Al-Kaisi et al., 2008). Sainju et al. (2012) also reported similar results in their multiple year study, where CO₂ emissions were higher in the fertilized treatments in 2009 but lower in 2008 and 2011. Our study had similar results where the treatments that received fertilizer had higher CO₂ emissions within the first five days after treatment application. However, after the first ten days, results were mixed and there were no CO₂-C emission differences between treatments at the end of the study. Roberts and Chan (1990) reported that

tillage increases carbon dioxide emissions by increasing soil aeration and through the movement of soil aggregates. Therefore, the differences in CO₂ emissions are a result from the soil aeration and movement of the soil aggregates as the treatments were applied at the beginning of the study.

Ammonia volatilization levels were relatively low during the first 15 days after treatment application, which was followed by a large increase in the 16-20 DFA block in all treatments except Urea + U. This is due to the urease inhibitor NBPT which slowed the hydrolysis of the urea molecule (Silva et al., 2017). Silva et al. (2017) also reported that NBPT reduced NH₃ losses by 50% in most of their conditions; however, our study did not see differences in NH₃ emissions. Drury et al. (2017) also reported that Urea coated with urease and nitrification inhibitors reduced ammonia losses by 60% when compared to the untreated urea treatment. These results are different from Clay et al. (1990a) where the hydrolysis inhibitor NBPT reduced ammonia losses. Differences between the current study and Clay et al. (1990a) were attributed to the experimental protocols, whereas soil was placed on top of the applied fertilizer treatment in this study. Clay et al. (1990a) reported that NBPT coated urea reduced ammonia emissions by 100 times over the four day study. In the 20 day mean emissions for the Urea and the Urea + U were 10.7 and 7.93 g NH₃-N ha⁻¹ day⁻¹. These values were not significantly different, $p=0.386$. Our results showed that the urease inhibitor NBPT did not reduce ammonia emissions as greatly as other studies have reported in our laboratory conditions.

1.6 CONCLUSIONS

This study concluded that ESN and Urea + U reduced N_2O emissions in a laboratory setting when compared to a conventional urea fertilizer. ESN and Urea + U did not increase $\text{CO}_2\text{-C}$ or $\text{NH}_3\text{-N}$ gas emissions. Furthermore, ESN and Urea + U did not reduce the soil test levels of $\text{NO}_3\text{-N}$ or $\text{NH}_4\text{-N}$. Altogether, this laboratory study confirmed that EEF can reduce N_2O emissions without reducing plant available nitrogen. The study did not report EEF's reducing greenhouse gas emissions as greatly as previously reported in other field studies.

1.7 ACKNOWLEDGEMENTS

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Chapter 2: Seasonal Changes Impact Microbial Community Structure, Carbon Dioxide, Nitrous Oxide, and Ammonia Emissions from Nitrogen Fertilizer Application.

2.1 ABSTRACT

Season induced changes in the microbial community structure may influence the relationships between soil temperature and moisture enough to impact nitrogen (N) losses through volatilization and denitrification. Current technologies allow for the near continuous measurement of these losses. The objectives of this research were to determine the influence of fertilizer application dates, in two different seasons (spring and fall) on residual inorganic N remaining in the soil, microbial community structure, and the relationships between soil temperature and soil water contents along with monitoring NH₃ volatilization, N₂O, and CO₂ emissions. Soil temperatures and moisture contents and N₂O, NH₃, and CO₂ emissions were measured for 21 days following the application of two N rates (0 and 224 kg urea-N ha⁻¹) at two soil moisture regimes (natural rainfall and natural rainfall + supplemental irrigation). The dates of application in the fall were 20 September 2017, 11 October 2017, and 1 November 2017 and the dates in the spring were 1 May 2018, 22 May 2018, and 12 June 2018. During each date, emissions were collected for 15 minutes at six time intervals daily (1.5-2.5, 5.5-6.5, 9.5-10.5, 13.5-14.5, 17.5-18.5, and 21.5-22.5 hours). Within each of the six fertilizer application dates, each treatment was replicated twice. The fall soil had a higher percentage of bacteria and actinomycetes than spring samples, whereas the spring samples had a higher percentage of undifferentiated microbial biomass that could not be characterized to specific organisms. These findings suggest that from fall to spring the

microbial community structure changed. In the fall, CO₂ and N₂O emissions decreased with decreasing soil and air temperatures. A similar relationship between temperature and emissions was not observed in the spring. Supplemental irrigation increased N₂O and NH₃ emissions; however, mixed results were noticed in CO₂ emissions.

2.2 INTRODUCTION

Greenhouse gas emissions (GHG) produced by agricultural activities are an important component of the carbon footprint (Clay et al., 2012; Stone et al., 2012; Lupo et al., 2013). In agriculture, the principal greenhouse gases are carbon dioxide, nitrous oxide, and methane. Nitrous oxide and CH₄ have a disproportionate impact on the carbon footprint because N₂O-N emissions are multiplied by 298 and CH₄-C emissions are multiplied by 20 to calculate the carbon dioxide equivalent-C value (CO_{2e}-C).

The amount of greenhouse gases that are emitted from agricultural activities depends on many factors including soil temperature, air temperature, rainfall, tillage, cover crops, and fertilizer applications. Each factor produces a unique signature on total emissions. For example, natural rainfall or irrigation can increase carbon dioxide and nitrous oxide emissions by increasing microbiological activity and carbon (C) and N mineralization (Sainju et al., 2010). Sainju et al. (2012) also reported that CO₂-C emissions increase with increasing soil moisture content. However, at high soil moisture contents, oxygen diffusion into the soil is slowed, which decreases aerobic respiration and increases denitrification (Linn and Doran, 1984). One of the gases emitted under anaerobic conditions is N₂O.

Tillage events typically increase short-term carbon dioxide emissions from the disruption of soil aggregates (Roberts and Chan, 1990). Also, the reduction of tillage decreases CO₂ and N₂O emissions due to a reduction in microbial activity (Drury et al., 2006). The addition of nitrogen fertilizer typically increases nitrous oxide emissions but a varied effect on carbon dioxide emissions has been noticed (Dusenbury et al., 2008; Al-Kaisi et al., 2008). However, carbon dioxide emissions tend to increase with increasing soil and air temperatures as microbiological activity increases.

The general effects of natural and man influenced activities on GHG emissions are generally known, however, no known studies to date have looked at different soil moisture regimes, temperature regimes, and nitrogen fertilizer rates on GHG emissions across seasons using a near continuous measurement system. Therefore, the objectives of this study were to determine (i) the effects of different soil moisture and temperature regimes on GHG emissions, (ii) to quantify the effects of nitrogen fertilizer application on GHG emissions, and (iii) compare and contrast GHG emissions from fall and spring fertilizer application dates.

2.3 MATERIALS AND METHODS

Study site

A field study was conducted at the Aurora Research Farm near Aurora, South Dakota (44° 18' 20.57" N, 96° 40' 14.04" W). The soil type was a Brandt silty clay loam (Fine-silty, mixed, superactive, frigid Calcic Hapludolls) (Soil Survey Staff, 2018), with percentage of clay, silt, and sand at 28%, 65%, and 7%, respectively. The initial soil organic carbon (SOC) for the surface 15 cm was 36 Mg ha⁻¹, and the carbon (C)

mineralization kinetics were previously discussed in Clay et al. (2015). The soil parent materials were loess (0-60 cm) over glacial outwash. The surface soil hydraulic conductivity ($k_{sp} = 0.72 \text{ m d}^{-1}$) for this site was previously measured and reported (Clay et al., 1994). The water contents at field capacity and the wilting point were 0.315 and 0.177 g g^{-1} , respectively, and soil bulk density (0-15 cm soil depth) at the beginning of the study was 1.29 g cm^{-3} . A more complete description of the soil is available in Kim et al. (2008) and Clay et al. (1995, 1996, 2015).

GHG chamber installation and measurement

Eight LI-COR LI-8100-104 long-term chambers (LI-COR, Lincoln, NE) were installed at the study site. The chambers were placed, in a random pattern on flat, barren soil with no vegetation or surface residue. In the spring of 2017, soybeans (*Glycine max*) were seeded and fertilizer was not applied. In the fall of 2017, the soybeans were cleared from the site. The spring 2018 site was adjacent to the fall 2017 site and it was managed similarly. These two sites had similar crop and soil management practices over the last five years. The total area of each fertilizer application date was approximately ten m^2 in which all of the chambers were placed. The chamber base was a 20.3 cm diameter Polyvinyl chloride (PVC) ring that was inserted into the ground approximately five cm, therefore, the total surface area for each chamber was 314 cm^2 . A LI-COR LI-8100-104 long-term chamber (LI-COR, Lincoln, NE) was placed on top of each individual PVC ring according to LI-COR protocol. Each individual chamber would automatically close for 15 minutes, every four hours, and collect the gas samples at six sampling intervals (0-2.5, 4-6.5, 8-10.5, 12-14.5, 16-18.5, and 20-22.5 hours). These times were selected to match the average air temperature (9.5-10.5 hours), the minimum air temperature (5.5-6.5

hours), and the maximum air temperature (13.5-14.5 hours). The chambers were vented and continuously mixed the air in the chamber. The air that was analyzed was returned back into its respective chamber.

During each chamber closing the gas samples were transferred through a plastic hose in the field to a LI-COR LI-8150 multiplexer (LI-COR, Lincoln, NE). The gas samples were collected and analyzed every second for CO₂ using a LI-COR LI-8100A Automated Soil CO₂ Flux System (LI-COR, Lincoln, NE). The gas samples were then transferred through a sampling harness to the Picarro Cavity Ringdown Spectrometer (Picarro) (Picarro Inc., Santa Clara, CA). The Picarro measured the gas samples for N₂O, CO₂, and NH₃. Nitrous oxide, and CO₂ were measured in parts per million (ppm) and NH₃ was measured in parts per billion (ppb). All N₂O, CO₂, and NH₃ results presented were analyzed by the Picarro.

Soil moisture was measured using a LI-COR LI-8150-205 Soil Moisture Probe (LI-COR, Lincoln, NE) and soil temperature was measured using a LI-COR LI-8150-201 Soil Temperature Probe (LI-COR, Lincoln, NE). The moisture and temperature probes were inserted into the soil approximately 5 cm. The probes measured soil moisture and soil temperature when its corresponding chamber was collecting gas samples. All of the data collection occurred at the sample location. The location was powered from a nearby electrical outlet and a back-up battery and surge protector were present. Analytical equipment was protected from the elements by a portable weatherproof trailer.

Treatments

The experiment was repeated three times during the fall of 2017 and three times in the spring of 2018. The first fall fertilizer application study was conducted between 20 September 2017 and 11 October 2017 (emissions measured 23 September to 11 October) when air temperature was 25°C at application. The second fall fertilizer application date was from 11 October 2017 to 1 November 2017 (emissions measured from 11 October to 1 November) when air temperature was 17°C at application. The third fall fertilizer application date was conducted from 1 November 2017 to 15 November 2017 (emissions measured from 1 November to 15 November) when air temperature was 7°C at application. The first spring fertilizer application date was conducted from 1 May 2018 to 22 May 2018 (emissions measured from 4 May to 20 May) when air temperature was 12°C at application. The second spring fertilizer application date was conducted from 22 May 2018 to 12 June 2018 (emissions measured from 22 May to 12 June) when air temperature was 32°C at application. The third, and final, spring fertilizer application date was conducted from 12 June 2018 to 3 July 2018 (emissions measured from 12 June to 3 July) when air temperature was 29°C at application. For each experiment, the chambers were moved to a new location within the study area. The move of chambers was less than five meters.

The experiment contained two N rates (0 and 224 kg urea-N ha⁻¹) and two soil moisture regimes (natural and natural + supplemental irrigation), each treatment was replicated twice. The urea fertilizer was dissolved in 10 mL of water and distributed onto the soil surface inside the PVC ring. The supplemental irrigation treatments received water every three to four days depending on natural rainfall. The supplemental irrigation consisted of a 1000 mL of water being deposited in the PVC ring. This resulted in an

irrigation event of 3.15 cm. The goal of the supplemental irrigation was to raise water filled porosity above 80%.

Supplemental irrigation was added to the treatments receiving supplemental irrigation (Urea & Water and Water treatments) at 11.00 hours after gas sampling had occurred. Due to high rainfall between 20 September and 1 October, the 20 September 2017 fertilizer application date only received supplemental irrigation once on 29 September 2017. Supplemental irrigation was added to the 11 October 2017 fertilizer application date on 17, 20, and 26 October 2017. In the 1 November 2017 fertilizer application date, supplemental irrigation was only added once on 2 November 2017. During the 1 November date, the Water treatment was not included. Supplemental irrigation was only added once at the beginning of the study as air temperatures were near or below freezing and the additional water could freeze in the chamber rings and damage the chambers. During the 1 November fertilizer application date, snow fell on 5, 7, and 9 November 2017, which remained in the chambers until 11 November 2017 when the snow melted. The total accumulation of snow during the three snowfall events was 3.8 cm. The snow was left inside the chambers and did not directly interfere with gas sampling. In the 1 May 2018 fertilizer application date, supplemental irrigation was added on 4, 15, and 18 May 2018. In the 22 May 2018 fertilizer application date, supplemental irrigation was added on 25 May 2018, 29 May 2018, 1 June 2018, and 6 June 2018. In the 12 June 2018 fertilizer application date supplemental irrigation was not added to any chambers due to the eleven rainfall events previously described above, therefore, the Urea & Water and Water treatments do not exist. This resulted in only two

treatments (Urea and Control) and four replications for this fertilization date were available instead of the originally designed two replications.

Calculation of Flux

The Picarro measured the gas samples at one second intervals for fifteen minutes. This resulted in 900 readings for each chamber closing. Flux was calculated using LI-COR SoilFluxPro™ software (ver 4.0.1) (LI-COR, Lincoln, NE). Corrections were applied individually for the collar offset from the PVC base on each of the eight LI-COR LI-8100-104 chambers. These corrections were measured four times for each collar offset which were averaged together. Flux was then calculated from 45 seconds to 900 seconds after chamber closing for N₂O and NH₃ and from 45 seconds to 165 seconds for CO₂. The Picarro's factory calibration was checked with N₂O standards at the beginning and end of the experiment. The standards were purchased from Airgas Specialty Gases (Airgas, USA, LLC Cinnaminson NJ), and they had concentrations of 0.378 and 149 ppm. The equation between the standard and the factory calibrations, conducted pre and post experiment was, $y=0.02+1.013 \times (\text{standard})$, $r^2=0.99$.

Soil Sampling

Soil samples were collected for bulk density, soil inorganic N, and soil moisture analysis from the 0- to 15- cm, 15- to 30- cm, 30- to 45- cm and 45- to 60- cm depths prior to and at the completion of each experiment. Beginning soil samples (Start) were collected from an area adjacent to the chambers and final samples were collected from the area within the PVC rings. Eight sample cores (1.25 cm diameter) of each representative depth were combined and frozen until analysis could be performed. A subsample of soil was removed and analyzed for gravimetric moisture content. The

moisture content was determined by drying the soil at 105°C and weighing the difference in initial vs. final weight. The gravimetric moisture content was multiplied by the bulk density to calculate soil volumetric moisture content. A second subsample was taken from the 0- to 15- cm depth for Phospholipid Fatty Acid (PFLA) analysis (Reese et al., 2014). The remaining soil was dried at 40°C and ground in preparation for ammonium and nitrate analysis (Clay et al., 2005).

Data Analysis

To calculate % soil nitrate in the 0 to 60 cm depths, soil ammonia and nitrate concentration were summed, and the nitrate portion was divided by the total soil available inorganic nitrogen. Mean values and confidence intervals were calculated in Microsoft Excel® 2010. A significant value of 95% was used for the confidence interval.

Each individual flux measurement was converted to $\text{g ha}^{-1} \text{ hr}^{-1}$. N_2O and NH_3 emissions were multiplied by 0.636 and 0.822, respectively, to represent N emissions and CO_2 was multiplied by 0.273 to represent C emissions. Therefore, emissions for N_2O are described in terms of $\text{N}_2\text{O-N}$, emissions for NH_3 and described in terms of $\text{NH}_3\text{-N}$, and emissions for CO_2 are described in terms of $\text{CO}_2\text{-C}$.

The ANOVA function in R (ver 3.4.3) (R Core Team, 2017) was used to test for differences. The model used for analysis was: $\gamma_{ij} = \mu + \tau_i + \varepsilon_{ij}$ whereas $\gamma_{ij} = j^{\text{th}}$ observed sample value from the i^{th} treatment ($j= 1,2,\dots,n_i$), ($i=1,2,\dots,k$), μ = grand mean, $\tau_i = i^{\text{th}}$ treatment effect, and ε_{ij} = random error. If differences were detected at α of 0.05 a Fisher least significant differences was used to determine differences between means using the agricolae (de Mendiburu, 2009) package in R.

To test for differences in air temperature, soil temperature, natural soil moisture, and natural + supplemental irrigation soil moisture content, the same model was used with a hypothesis of $\mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 = \mu_6$, where μ_1 = 20 September 2017 fertilizer application date, μ_2 = 11 October 2017 fertilizer application date, etc. The model was further split into three, seven day intervals (0-7, 8-14, and 15-21 days following application) (DFA) to test for differences in each corresponding week of each fertilizer application period.

To test for treatment differences within a fertilizer application date, the same model was used with a hypothesis of $\mu_{UW} = \mu_U = \mu_W = \mu_C$, where μ_{UW} = mean emissions of Urea & Water treatment, μ_U = mean emissions of Urea treatment, etc. The model was further split into three, seven day intervals (0-7, 8-14, and 15-21 DFA) to test for differences in each corresponding week of each fertilizer application period. This approach was repeated for N_2O-N , NH_3-N , and CO_2-C .

To test for treatment differences (Urea & Water, Urea, Water, and Control) across fertilizer application dates, the same model was used with a hypothesis of $\mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 = \mu_6$, where μ_1 = 20 September 2017 fertilizer application date, μ_2 = 11 October 2017 fertilizer application date, etc. The model was further split into three, seven day intervals (0-7, 8-14, and 15-21 DFA) to test for differences in each corresponding week of each fertilizer application period. This approach was repeated for N_2O-N , NH_3-N , and CO_2-C .

To test for differences in the PLFA soil results, a two-tailed Student's T-Test of unequal variance was performed. The model used was $\mu_f = \mu_s$, whereas μ_f = the fall PLFA results and μ_s = the spring PLFA results. The procedure was repeated for total

biomass, percent bacteria, percent fungi, and percent undifferentiated. This analysis was performed in Microsoft Excel® 2010.

To test for differences in the soluble organic carbon (SOC) soil results, a two-tailed Student's T-Test of unequal variance was performed. The model used was $\mu_f = \mu_s$, whereas μ_f = the fall SOC results and μ_s = the spring SOC results. This analysis was performed in Microsoft Excel® 2010.

2.4 RESULTS

Rainfall and soil temperatures

Across the six fertilizer application dates, there were large differences in rainfall and temperature. In the fall of 2017, the mean soil temperatures for the surface 5 cm decreased from 15.0 to 2.86 °C as the season progressed from 20 September to 14 November (Table 2.1). In the following spring, soil temperatures slowly increased and the average temperature for the 0- to 5- cm depth was 12.3 °C for the time period between 5 May and 22 May. For the time period between 22 May and 12 June the average surface soil (0- to 5- cm) temperature was 19.9 °C and for the 12 June to 3 July time period the average temperature was 20.5 °C (Table 2.1).

Natural rainfall events also varied greatly between fertilizer application dates. The 20 September to 11 October period had the highest rainfall of the six fertilizer application dates with 14.3 cm of rainfall. This large rainfall total was attributed to large rainfall events on 23 September 2017 and 1 October 2017 which resulted in 6.6 and 2.6 cm of rain, respectively. Rainfall between 11 October and 1 November, 1 November and 15 November, 1 May and 22 May, 22 May and 12 June, and 22 June and 3 July was 0.51,

0.78, 1.8, 2.9, and 10.0 cm, respectively. Between 12 June and 3 July, the chambers received eleven small rainfall events. The largest of these events occurred on 25 June when 0.99 cm of natural rainfall was received.

Table 2.1: All observations and seven day interval means for soil temperature, air temperature, supplemental soil moisture content, and natural rainfall soil moisture content for the six fertilizer application dates.

All	Mean Soil Temperature	Mean Air Temperature	Supplemental irrigation SMC	Natural rainfall SMC
Experiment	°C	°C	-----cm ³ cm ⁻³ -----	-----
20 September, 2017	15.0b†	12.9d	-	0.44a
11 October, 2017	9.36d	7.15e	0.36a	0.28c
1 November, 2017	2.86e	-1.28f	-	0.24d
1 May, 2018	12.3c	15.8c	0.36a	0.37b
22 May, 2018	20.5a	23.7a	0.30b	0.24d
12 June, 2018	19.9a	22.6b	-	0.27c
p-value	<0.001	<0.001	<0.001	<0.001

0-7 DFA	Mean Soil Temperature	Mean Air Temperature	Supplemental irrigation SMC	Natural rainfall SMC
Experiment	°C	°C	-----cm ³ cm ⁻³ -----	-----
20 September, 2017	17.5c	15.6d	-	0.45a
11 October, 2017	10.9d	9.36e	0.35a	0.31c
1 November, 2017	3.31e	-2.12f	-	0.24d
1 May, 2018	12.4d	17.5c	0.36a	0.39b
22 May, 2018	21.4a	25.6a	0.30b	0.24d
12 June, 2018	20.0b	22.9b	-	0.23d
p-value	<0.001	<0.001	<0.001	<0.001

8-14 DFA	Mean Soil Temperature	Mean Air Temperature	Supplemental irrigation SMC	Natural rainfall SMC
Experiment	°C	°C	-----cm ³ cm ⁻³ -----	-----
20 September, 2017	15.2c	13.6c	-	0.45a
11 October, 2017	12.2d	10.7d	0.39a	0.27c
1 November, 2017	2.19e	-0.03e	-	0.24d
1 May, 2018	10.7d	13.2c	0.37a	0.37a
22 May, 2018	20.6a	23.3a	0.31b	0.24d
12 June, 2018	18.8b	21.2b	-	0.29c
p-value	<0.001	<0.001	<0.001	<0.001

15-21 DFA	Mean Soil Temperature	Mean Air Temperature	Supplemental irrigation SMC	Natural rainfall SMC
Experiment	°C	°C	-----cm ³ cm ⁻³ -----	-----
20 September, 2017	11.8d	9.16d	-	0.42a
11 October, 2017	3.99e	0.05e	0.33a	0.24c
1 May, 2018	15.0c	18.0c	0.33a	0.33b
22 May, 2018	19.0b	21.6b	0.29b	0.24c
12 June, 2018	21.2a	23.9a	-	0.30b
p-value	<0.001	<0.001	<0.001	<0.001

All = all observations, SMC = soil moisture content, DFA= days following application

† values within a column and within a group that have the same letter are not significantly different at $\alpha = 0.05$

Soil temperature (0- to 5- cm soil depth) was warmest (across the duration of the study) during the 22 May 2018 fertilizer application date at 20.5 °C which was followed by 12 June 2018, 20 September 2017, 1 May 2018, 11 October 2017, and 1 November 2017 (Table 2.1). In the fall of 2017, the experiments were conducted during a period of time that the soil was cooling (20 September to 14 November) and spring 2018 experiments were conducted when the soils were warming (1 May to 3 July). For the 1 November 2017 study, the night-time soil temperatures decreased to less than 0 °C eight days after the fertilizer was applied. For the spring 2018 fertilizer application dates, the temperatures deviated for short periods of time when soil temperatures increased and for short periods of time when it decreased. For the 1 May 2018 and 12 June 2018 fertilizer application dates, soil temperatures were the coolest during the middle of the study (8-14 DFA).

Air temperatures followed a similar trend to soil temperatures as described above. Some noticeable exceptions include that all 2018 dates had higher mean air temperatures than the 2017 dates. Also, the 2017 fertilizer application dates had mean soil temperatures, which were warmer than the air temperatures. However, for the 2018 fertilizer application dates, the reverse was true. This is important because soil microbial respiration tends to increase with soil temperature.

Soil moisture contents varied greatly across the six fertilizer application dates. When looking at all days within each fertilizer application date, the 20 September 2017 date had the highest mean natural rainfall volumetric soil moisture content at 0.44 cm³ cm⁻³, which was followed by 1 May 2018, 11 October 2017, 12 June 2018, 1 November

2017, and 22 May 2018 with volumetric soil moisture contents of 0.37, 0.28, 0.27, 0.24, and $0.24 \text{ cm}^3 \text{ cm}^{-3}$, respectively (Table 2.1).

The supplemental irrigation volumetric soil moisture contents were not measured during the 20 September 2017 (soil moisture sensor failure), 1 November 2017 (soil moisture sensor failure), and 12 June 2018 (no supplemental irrigation was added) fertilizer application dates. In the three fertilizer application dates where supplemental irrigation soil moisture contents were available, the 11 October 2017 and 1 May 2018 volumetric soil moisture contents were similar to each other across all seven day intervals. The 22 May 2018 fertilizer application date had lower volumetric soil moisture contents when compared to the 11 October 2017 and 1 May 2018 application dates.

When comparing volumetric soil moisture contents between the supplemental irrigation and natural rainfall moisture regimes; supplemental irrigation tended to raise the volumetric soil moisture content $0.07 \text{ cm}^3 \text{ cm}^{-3}$ when the 1 May 2018 fertilizer application date is excluded (Table 2.1). In the 1 May 2018 fertilizer application date, the supplemental irrigation soil moisture content was lower than the natural rainfall soil moisture content in 0-7 DFA and the soil moisture contents were the same for the 8 to 14 and 15 to 21 DFA.

Soil Test Results

Bulk density was measured for both the fall 2017 and spring 2018 dates. The fall 2017 bulk density measurements were 1.29, 1.22, 1.22, and 1.22 g cm^3 for the 0- to 15-, 15- to 30-, 30- to 45-, and 45- to 60- cm depths, respectively. The spring 2018 bulk density measurements were 1.34, 1.30, 1.30, and 1.30 g cm^3 for the 0- to 15-, 15- to 30-, 30- to 45-, and 45- to 60- cm depths, respectively.

Table 2.2: Soil sample total inorganic nitrogen, nitrate levels, and nitrate confidence levels for the fertilized treatments (Urea and Urea & Water) in the 0- to 60- cm soil depth for all six fertilizer application dates.

Fertilizer Application Date	Total Inorganic N kg N ha ⁻¹	NO ₃ -N	
		%	95% CL
20 September, 2017	218	68.9	3.36
11 October, 2017	211	37.5	22.9
1 November, 2017	210	28.1	1.65
1 May, 2018	131	62.4	4.18
22 May, 2018	181	65.2	9.88
12 June, 2018	202	65.1	7.13

N = Nitrogen, CL= confidence level

Total soil inorganic N remained similar during the three fall 2017 fertilizer application dates, however, soil inorganic N levels increased during the three spring 2018 fertilizer application dates. Soil test nitrate levels decreased during the fall 2017 fertilizer application periods from 68.9% during the 20 September date to 37.5 and 28.1% during the 11 October and 1 November dates, respectively (Table 2.2). These findings suggest that nitrification slowed as the season progressed. Ramifications of these findings are that N₂O emissions from nitrification should decrease as the season progressed. For the spring 2018, different results were observed with % NO₃-N remaining similar in the fertilized treatment across the application dates (Table 2.2). These findings indicate that nitrous oxide emissions from nitrification should be relatively constant in the spring.

Soil SOC also changed from the fall of 2017 to spring of 2018. Samples were collected during the 11 October and 22 May fertilizer application dates. The 11 October fertilizer application date had 0.37 mg SOC (g soil)⁻¹ whereas the 22 May fertilizer application date had 0.10 mg SOC (g soil)⁻¹. These samples were significantly different with a p-value of <0.001.

Nitrous Oxide Emissions

Nitrous oxide mean emissions during the three fall fertilizer application dates were highest, regardless of treatment, during the 20 September fertilizer application date. This is a result of higher soil and air temperatures as described in Table 2.1 along with higher soil $\text{NO}_3\text{-N}$ levels as described in Table 2.2. Nitrous oxide-nitrogen mean emissions during the 20 September date and within a treatment were similar across the course of study. For the 11 October 2017 fertilizer application date, there was a large mean $\text{N}_2\text{O-N}$ emissions decrease between 8-14 and 15-21 DFA regardless of treatment. This was attributed to the decrease in air and soil temperatures (Table 2.1) and a decrease in soil nitrate levels (Table 2.2). During the 1 November date, mean $\text{N}_2\text{O-N}$ emissions were very low $0.02 \text{ g N}_2\text{O-N ha}^{-1} \text{ hr}^{-1}$ regardless of treatment and treatments were not different (Table 2.3). In the 20 September fertilizer application date, Urea had the highest mean $\text{N}_2\text{O-N}$ emissions of $2.21 \text{ g N}_2\text{O-N ha}^{-1} \text{ hr}^{-1}$, which was followed by the Urea & Water, Control, and the Water treatments with mean emissions of 2.01, 1.89, 1.76 $\text{g N}_2\text{O-N ha}^{-1} \text{ hr}^{-1}$, respectively (Table 2.3). In the 11 October date, Urea & Water had the highest mean $\text{N}_2\text{O-N}$ emissions of $0.23 \text{ g N}_2\text{O-N ha}^{-1} \text{ hr}^{-1}$ which was followed by Water, Urea, and the Control treatments with mean emissions of 0.20, 0.13, 0.06 $\text{g N}_2\text{O-N ha}^{-1} \text{ hr}^{-1}$, respectively (Table 2.3). For the 1 November 2017 fertilizer application date, mean $\text{N}_2\text{O-N}$ emissions were similar among the treatments. The lack of differences was attributed to the low soil temperatures.

Table 2.3: N₂O-N mean emissions for the three fall fertilizer application dates along with mean N₂O-N emissions for each seven day interval.

20 September, 2017	Mean Emissions			
	0-7 DFA	8-14 DFA	15-21 DFA	All
Treatment	-----g N ₂ O-N ha ⁻¹ hr ⁻¹ -----			
Urea & Water	1.51b†	2.47a	2.03b	2.01ab
Urea	2.26a	2.19a	2.17b	2.21a
Water	1.09c	1.61b	2.63a	1.76c
Control	1.36bc	2.17a	2.15b	1.89bc
p-value	<0.001	0.005	<0.001	0.001

11 October, 2017	Mean Emissions			
	0-7 DFA	8-14 DFA	15-21 DFA	All
Treatment	-----g N ₂ O-N ha ⁻¹ hr ⁻¹ -----			
Urea & Water	0.32a	0.26a	0.04a	0.23a
Urea	0.24b	0.08c	0.03b	0.13b
Water	0.34a	0.15b	0.03b	0.20a
Control	0.10c	0.04c	0.02b	0.06c
p-value	<0.001	<0.001	0.009	<0.001

1 November, 2017	Mean Emissions			
	0-7 DFA	8-14 DFA	15-21 DFA	All
Treatment	-----g N ₂ O-N ha ⁻¹ hr ⁻¹ -----			
Urea & Water	0.02	0.02b	-	0.02
Urea	0.02	0.03a	-	0.02
Control	0.02	0.02b	-	0.02
p-value	0.927	0.005	-	0.086

DFA = days following fertilizer application, All = all observations, Urea & Water = 224 kg N ha⁻¹ with supplemental irrigation, Urea = 224 kg N ha⁻¹, Water = supplemental irrigation, Control = no treatment added.

† values within a column and within a fertilizer application date that have the same letter are not significantly different at $\alpha = 0.05$

For the spring fertilizer application dates, mean N₂O-N emissions were highest when fertilizer was applied on 1 May 2018. This application date also had the lowest soil temperatures. These findings are different than the fall, where emissions and temperature were positively correlated, and they suggest that distinct differences between the seasons impacts microbial activity and emissions. In the 1 May date, the unfertilized control treatment had the highest mean N₂O-N emissions of 0.81 g N₂O-N ha⁻¹ hr⁻¹ which was followed by Urea & Water, Urea, and Water with mean N₂O-N emissions of 0.63, 0.60, and 0.18 g N₂O-N ha⁻¹ hr⁻¹, respectively (Table 2.4).

For the 22 May 2018 application date, the Urea & Water had the highest mean N₂O-N emissions of 0.34 g N₂O-N ha⁻¹ hr⁻¹ which was followed by Water, Urea, and Control treatments with mean N₂O-N emissions of 0.10, 0.09, and 0.09 g N₂O-N ha⁻¹ hr⁻¹, respectively (Table 2.4). In the 12 June date, Urea had the highest mean N₂O-N emissions of 0.35 g N₂O-N ha⁻¹ hr⁻¹ which was followed by the control with mean N₂O-N emissions of 0.09 g N₂O-N ha⁻¹ hr⁻¹ (Table 2.4).

Table 2.4: N₂O-N mean emissions for the three spring fertilizer application dates along with mean N₂O-N emissions for each seven day interval.

1 May, 2018	Mean Emissions			
	0-7 DFA	8-14 DFA	15-21 DFA	All
Treatment	-----g N ₂ O-N ha ⁻¹ hr ⁻¹ -----			
Urea & Water	0.67b†	0.66a	0.50a	0.63b
Urea	0.65b	0.70a	0.35b	0.60b
Water	0.23c	0.16b	0.12c	0.18c
Control	1.14a	0.75a	0.47ab	0.81a
p-value	<0.001	<0.001	<0.001	<0.001

22 May, 2018	Mean Emissions			
	0-7 DFA	8-14 DFA	15-21 DFA	All
Treatment	-----g N ₂ O-N ha ⁻¹ hr ⁻¹ -----			
Urea & Water	0.38a	0.32a	0.29a	0.34a
Urea	0.10b	0.09b	0.10b	0.09b
Water	0.14b	0.08b	0.05c	0.10b
Control	0.15b	0.06b	0.04c	0.09b
p-value	<0.001	<0.001	<0.001	<0.001

12 June, 2018	Mean Emissions			
	0-7 DFA	8-14 DFA	15-21 DFA	All
Treatment	-----g N ₂ O-N ha ⁻¹ hr ⁻¹ -----			
Urea	0.15a	0.46a	0.51a	0.35a
Control	0.07b	0.12b	0.10b	0.09b
p-value	<0.001	<0.001	<0.001	<0.001

DFA = days following fertilizer application, All = all observations, Urea & Water = 224 kg N ha⁻¹ with supplemental irrigation, Urea = 224 kg N ha⁻¹, Water = supplemental irrigation, Control = no treatment added.

† values within a column and within a fertilizer application date that have the same letter are not significantly different at $\alpha = 0.05$

Like the 20 September date, the 1 May date had higher mean $\text{N}_2\text{O-N}$ emissions from the treatments receiving Urea, with the exception of the Control treatment during the 1 May fertilizer application period. The 1 May Control treatment had relatively large $\text{N}_2\text{O-N}$ emissions and the cause of this is unknown. It likely was a result of chamber placement but both Control chambers displayed higher emissions. Across the five fertilizer application dates that received supplemental irrigation, supplemental irrigation tended to increase $\text{N}_2\text{O-N}$ emissions, however, increases in mean $\text{N}_2\text{O-N}$ emissions were not significantly different at α of 0.05. Also, mean $\text{N}_2\text{O-N}$ emissions were fairly constant within treatments across the length of each fertilizer application date, except 11 October as described above. The later spring fertilizer application dates did not result in a decrease in $\text{N}_2\text{O-N}$ emissions; this would suggest that delaying nitrogen fertilizer application would not decrease $\text{N}_2\text{O-N}$ emissions. Peak $\text{N}_2\text{O-N}$ emissions were never noticed and this suggests that the 21 day course of study was not long enough to capture the peak $\text{N}_2\text{O-N}$ emissions.

Ammonia Emissions

During the 2017 fall fertilizer application dates, mean $\text{NH}_3\text{-N}$ emissions were highest in the 20 September fertilizer application date when soil and air temperatures were warmer than the 11 October and 1 November dates. In the 20 September date, Urea & Water had the highest mean $\text{NH}_3\text{-N}$ emissions of $3.45 \text{ g NH}_3\text{-N ha}^{-1} \text{ hr}^{-1}$ which was followed by Urea, Water, and Control treatments with mean $\text{NH}_3\text{-N}$ emissions of 3.03, 0.17, and $0.02 \text{ g NH}_3\text{-N ha}^{-1} \text{ hr}^{-1}$, respectively (Table 2.5). In the 11 October date, Urea & Water once again had the highest mean $\text{NH}_3\text{-N}$ emissions of $1.88 \text{ g NH}_3\text{-N ha}^{-1} \text{ hr}^{-1}$ which was followed by Water, Control, and Urea with mean $\text{NH}_3\text{-N}$ emissions of 1.08,

0.22, and 0.19 g NH₃-N ha⁻¹ hr⁻¹, respectively (Table 2.5). In the 1 November date, Urea had the highest mean NH₃-N emissions of 0.73 g NH₃-N ha⁻¹ hr⁻¹ which was followed by Urea & Water and the Control with mean NH₃-N emissions of 0.22 and 0.13 g NH₃-N ha⁻¹ hr⁻¹, respectively (Table 2.5).

Ammonia and N₂O-N emissions tend to follow one another. During the 20 September date the treatments receiving urea had higher NH₃-N and N₂O-N emissions, during the 11 October fertilizer application date, the treatments receiving supplemental irrigation had higher NH₃-N and N₂O-N emissions. However, during the 1 November date there were NH₃-N emission differences but no difference in N₂O-N emissions. To further confirm this assumption, in the 11 October date NH₃-N emissions dropped sharply, like N₂O-N emissions; between 8-14 DFA and 15-21 DFA when air and soil temperatures sharply decrease as described in Table 2.1.

Table 2.5: NH₃-N mean emissions for the three fall fertilizer application dates along with mean NH₃-N emissions for each seven day interval.

20 September, 2017	Mean Emissions			
	0-7 DFA	8-14 DFA	15-21 DFA	All
Treatment	-----g NH ₃ -N ha ⁻¹ hr ⁻¹ -----			
Urea & Water	8.94	0.28	0.07	3.45a
Urea	6.45	0.11	0.02	3.03a
Water	0.21	0.27	0.07	0.17b
Control	0.03	0.01	0.02	0.02b
p-value	0.061	0.538	0.183	0.002

11 October, 2017	Mean Emissions			
	0-7 DFA	8-14 DFA	15-21 DFA	All
Treatment	-----g NH ₃ -N ha ⁻¹ hr ⁻¹ -----			
Urea & Water	3.57a†	0.97	0.16	1.88a
Urea	0.25b	0.47	0.10	0.19c
Water	4.35a	0.66	0.07	1.08b
Control	0.55b	0.24	0.07	0.22bc
p-value	<0.001	0.506	0.485	<0.001

1 November, 2017	Mean Emissions			
	0-7 DFA	8-14 DFA	15-21 DFA	All
Treatment	-----g NH ₃ -N ha ⁻¹ hr ⁻¹ -----			
Urea & Water	0.26	0.15b	-	0.22b
Urea	0.26	1.36a	-	0.73a
Control	0.16	0.05b	-	0.13b
p-value	0.558	<0.001	-	<0.001

DFA = days following fertilizer application, All = all observations, Urea & Water = 224 kg N ha⁻¹ with supplemental irrigation, Urea = 224 kg N ha⁻¹, Water = supplemental irrigation, Control = no treatment added.

† values within a column and within a fertilizer application date that have the same letter are not significantly different at $\alpha = 0.05$

In the 1 May fertilizer application date, Urea & Water had the highest mean $\text{NH}_3\text{-N}$ emissions of $6.11 \text{ g NH}_3\text{-N ha}^{-1} \text{ hr}^{-1}$, which was followed by Urea, Water, and the Control treatments with mean $\text{NH}_3\text{-N}$ emissions of 2.00, 1.40, and $0.23 \text{ g NH}_3\text{-N ha}^{-1} \text{ hr}^{-1}$, respectively (Table 2.6). In the 22 May date, Urea & Water once again had the highest mean $\text{NH}_3\text{-N}$ emissions of $7.09 \text{ g NH}_3\text{-N ha}^{-1} \text{ hr}^{-1}$ which was followed by the Control, Urea, and Water treatments with mean $\text{NH}_3\text{-N}$ emissions of 1.97, 0.56, and $0.21 \text{ g NH}_3\text{-N ha}^{-1} \text{ hr}^{-1}$, respectively (Table 2.6). In the 12 June date, Urea had the highest mean $\text{NH}_3\text{-N}$ emissions of $1.13 \text{ g NH}_3\text{-N ha}^{-1} \text{ hr}^{-1}$ which was followed by the Control with mean $\text{NH}_3\text{-N}$ emissions of $0.40 \text{ g NH}_3\text{-N ha}^{-1} \text{ hr}^{-1}$ (Table 2.6). $\text{NH}_3\text{-N}$ mean emissions were also highest during the first seven days following fertilizer application (Table 2.6).

Table 2.6: NH₃-N mean emissions for the three spring fertilizer application dates along with mean NH₃-N emissions for each seven day interval.

1 May, 2018	Mean Emissions			
	0-7 DFA	8-14 DFA	15-21 DFA	All
Treatment	-----g NH ₃ -N ha ⁻¹ hr ⁻¹ -----			
Urea & Water	14.2a†	0.10b	0.07	6.11a
Urea	5.07b	0.70a	0.36	2.00b
Water	4.17b	0.01b	0.03	1.40b
Control	0.87b	0.01b	0.05	0.23b
p-value	<0.001	0.045	0.563	<0.001

22 May, 2018	Mean Emissions			
	0-7 DFA	8-14 DFA	15-21 DFA	All
Treatment	-----g NH ₃ -N ha ⁻¹ hr ⁻¹ -----			
Urea & Water	13.1a	1.28a	0.10b	7.09a
Urea	1.36b	0.45b	0.07b	0.56b
Water	0.22b	0.18b	0.30a	0.21b
Control	7.33ab	0.32b	0.27ab	1.97ab
p-value	<0.001	<0.001	<0.001	<0.001

12 June, 2018	Mean Emissions			
	0-7 DFA	8-14 DFA	15-21 DFA	All
Treatment	-----g NH ₃ -N ha ⁻¹ hr ⁻¹ -----			
Urea	2.54	0.39	0.08	1.13
Control	0.42	0.60	0.09	0.40
p-value	0.462	0.667	0.992	0.267

DFA = days following fertilizer application, All = all observations, Urea & Water = 224 kg N ha⁻¹ with supplemental irrigation, Urea = 224 kg N ha⁻¹, Water = supplemental irrigation, Control = no treatment added.

† values within a column and within a fertilizer application date that have the same letter are not significantly different at $\alpha = 0.05$

In most cases the 2018 spring fertilizer application dates had higher $\text{NH}_3\text{-N}$ emissions than the 2017 fall dates. This a direct result of the 2018 spring dates having higher soil and air temperatures than the fall 2017 dates as described in Table 2.1. Within each treatment fertilizer application date, $\text{NH}_3\text{-N}$ emissions generally were highest during the first seven days following fertilizer application; with the exception of 1 November 2017 fertilizer application date. This data suggests that the peak $\text{NH}_3\text{-N}$ emissions occur within the first seven days following fertilizer application, unlike $\text{N}_2\text{O-N}$ in which the 21 day length of study did not incorporate peak $\text{N}_2\text{O-N}$ emissions. The supplemental irrigation increased mean $\text{NH}_3\text{-N}$ emissions in every fertilizer application date except during the 1 November 2017, when the Urea treatment had highest mean $\text{NH}_3\text{-N}$ emissions, and the 22 May 2018 date when the Control treatment had higher mean $\text{NH}_3\text{-N}$ emissions than the Water treatment.

Carbon Dioxide Emissions

During the three 2017 fall fertilizer application dates, the 20 September date had the highest $\text{CO}_2\text{-C}$ emissions. During the 20 September date the Control treatment had the highest mean $\text{CO}_2\text{-C}$ emissions of $3080 \text{ g CO}_2\text{-C ha}^{-1} \text{ hr}^{-1}$ which was followed by Urea, Water, and Urea & Water treatments with mean $\text{CO}_2\text{-C}$ emissions of 2850, 2790, and $2420 \text{ g CO}_2\text{-C ha}^{-1} \text{ hr}^{-1}$, respectively (Table 2.7). During the 11 October date, Urea & Water had the highest mean emissions of $614 \text{ g CO}_2\text{-C ha}^{-1} \text{ hr}^{-1}$ which was followed by Urea, Control, and the Water treatments with mean emissions of 511, 494, and $470 \text{ g CO}_2\text{-C ha}^{-1} \text{ hr}^{-1}$, respectively (Table 2.7). In the 1 November date, Urea had the highest mean emissions of $429 \text{ g CO}_2\text{-C ha}^{-1} \text{ hr}^{-1}$ which was followed by the Urea & Water and

Control treatments with mean emissions of 360 and 215 g CO₂-C ha⁻¹ hr⁻¹, respectively (Table 2.7).

When comparing soil and air temperatures to CO₂-C emissions, the CO₂-C emissions did not closely coincide. For example, in the 20 September fertilizer application period, air and soil temperatures decrease across the 21 day course of study (Table 2.1), however, for most treatments, emissions were lowest at 8-14 DFA then they increased at 15-21 DFA. In the 11 October date, CO₂-C means emissions did not drop as sharply at 15-21 DFA as mean CO₂-C emissions noticed in both N₂O-N and NH₃-N. In the 1 November date, CO₂-C mean emissions are still relatively high when compared to N₂O-N and NH₃-N

Table 2.7: CO₂-C mean emissions for the three fall fertilizer application dates along with mean CO₂-C emissions for each seven day interval.

20 September, 2017	Mean Emissions			
	0-7 DFA	8-14 DFA	15-21 DFA	All
Treatment	-----g CO ₂ -C ha ⁻¹ hr ⁻¹ -----			
Urea & Water	3050b†	1920b	2290c	2420b
Urea	4500a	1820b	2210c	2850ab
Water	3030b	1970b	3470a	2790ab
Control	3260b	3070a	2900b	3080a
p-value	0.035	<0.001	<0.001	0.036

11 October, 2017	Mean Emissions			
	0-7 DFA	8-14 DFA	15-21 DFA	All
Treatment	-----g CO ₂ -C ha ⁻¹ hr ⁻¹ -----			
Urea & Water	884a	617a	251b	614a
Urea	680b	421c	381a	511b
Water	673b	474bc	217b	470b
Control	512c	513b	438a	494b
p-value	<0.001	<0.001	<0.001	<0.001

1 November, 2017	Mean Emissions			
	0-7 DFA	8-14 DFA	15-21 DFA	All
Treatment	-----g CO ₂ -C ha ⁻¹ hr ⁻¹ -----			
Urea & Water	440a	239b	-	360b
Urea	450a	396a	-	429a
Control	223b	203b	-	215c
p-value	<0.001	<0.001	-	<0.001

DFA = days following fertilizer application, All = all observations, Urea & Water = 224 kg N ha⁻¹ with supplemental irrigation, Urea = 224 kg N ha⁻¹, Water = supplemental irrigation, Control = no treatment added.

† values within a column and within a fertilizer application date that have the same letter are not significantly different at $\alpha = 0.05$

In the 1 May fertilizer application date, the Urea treatment had the highest CO₂-C mean emissions of 1330 g CO₂-C ha⁻¹ hr⁻¹ which was followed by Urea & Water, Control, and the Water treatments with mean CO₂-C emissions of 1210, 1090 and 843 g CO₂-C ha⁻¹ hr⁻¹, respectively (Table 2.8). In the 22 May date, the Water treatment had the highest mean CO₂-C emissions of 1360 g CO₂-C ha⁻¹ hr⁻¹ which was followed by the Control, Urea & Water, and Urea treatments with mean CO₂-C emissions of 1230, 1130, and 975 g CO₂-C ha⁻¹ hr⁻¹, respectively (Table 2.8). In the 12 June date the Control treatment had the highest mean CO₂-C emissions of 1320 g CO₂-C ha⁻¹ hr⁻¹ which was followed by the Urea treatment with mean CO₂-C emissions of 1010 g CO₂-C ha⁻¹ hr⁻¹ (Table 2.8).

Overall, CO₂-C emissions during the three 2018 spring fertilizer application periods were similar with a range of only 520 g CO₂-C ha⁻¹ hr⁻¹. Carbon dioxide emissions also did not trend closely with soil or air temperatures. An example of this is in the 22 May fertilizer application date. Mean soil and air temperatures across the course of the study decreased (Table 2.1), however, CO₂-C emissions were generally lowest in the 8-14 DFA interval which did not correspond with the lowest soil or air temperatures. A similar pattern can be noticed in both the 1 May and 12 June fertilizer application dates.

Table 2.8: CO₂-C mean emissions for the three spring fertilizer application dates along with mean CO₂-C emissions for each seven day interval.

1 May, 2018	Mean Emissions			
	0-7 DFA	8-14 DFA	15-21 DFA	All
Treatment	-----g CO ₂ -C ha ⁻¹ hr ⁻¹ -----			
Urea & Water	1250a†	900bc	1720a	1210b
Urea	1390a	1160a	1550ab	1330a
Water	843b	795c	926c	843c
Control	984b	1000b	1410ab	1090b
p-value	<0.001	<0.001	<0.001	<0.001

22 May, 2018	Mean Emissions			
	0-7 DFA	8-14 DFA	15-21 DFA	All
Treatment	-----g CO ₂ -C ha ⁻¹ hr ⁻¹ -----			
Urea & Water	1450a	847b	1020b	1130b
Urea	1010b	991ab	914b	975c
Water	1450a	1140a	1510a	1360a
Control	1160b	1150a	1420a	1230b
p-value	<0.001	<0.001	<0.001	<0.001

12 June, 2018	Mean Emissions			
	0-7 DFA	8-14 DFA	15-21 DFA	All
Treatment	-----g CO ₂ -C ha ⁻¹ hr ⁻¹ -----			
Urea	1230	903b	873b	1010b
Control	1240	1330a	1470a	1320a
p-value	0.918	<0.001	<0.001	<0.001

DFA = days following fertilizer application, All = all observations, Urea & Water = 224 kg N ha⁻¹ with supplemental irrigation, Urea = 224 kg N ha⁻¹, Water = supplemental irrigation, Control = no treatment added.

† values within a column and within a fertilizer application date that have the same letter are not significantly different at $\alpha = 0.05$

Across all six different fertilizer application dates, treatments did play an effect in each individual fertilizer application period, however, when comparing across the different dates, no treatment resulted in higher CO₂-C emissions. The addition of nitrogen based fertilizer did not increase CO₂-C emissions. Air and soil temperatures did not have as large an impact on CO₂-C emissions as expected.

Treatment Effects across Fertilizer Application Dates

When looking at the Urea & Water treatment, N₂O-N emissions and CO₂-C emissions were highest during the 20 September 2017 fertilizer application date with mean emissions of 2.01 g N₂O-N ha⁻¹ hr⁻¹ and 2420 g CO₂-C ha⁻¹ hr⁻¹, respectively (Table 2.9). Ammonia-nitrogen emissions were highest during the 22 May 2018 and 1 May 2018 dates with mean NH₃-N emissions of 7.09 and 6.11 g NH₃-N ha⁻¹ hr⁻¹, respectively (Table 2.9). The 11 October and 1 November dates only emitted trace amounts of the measured GHG's.

In the 20 September 2017 fertilizer application date, N₂O-N, NH₃-N, and CO₂-C emissions were highest with mean emissions of 2.21 g N₂O-N ha⁻¹ hr⁻¹, 3.04 g NH₃-N ha⁻¹ hr⁻¹, and 2850 g CO₂-C ha⁻¹ hr⁻¹, respectively (Table 2.9). Like the Urea & Water treatment, all GHG emissions were relatively low in the 11 October 2017 and 1 November 2017 fertilizer application dates. The three 2018 spring dates had similar GHG emissions.

The Water treatment had little effect on N₂O-N emissions except in the 20 September 2017 fertilizer application date when mean N₂O-N emissions were 1.76 g N₂O-N ha⁻¹ hr⁻¹ (Table 2.9); however supplemental irrigation was only added once.

Supplemental irrigation did increase emissions in the 11 October 2017 and 1 May 2018 dates. However, these increases also correspond to the coolest soil and air temperatures (Table 2.1) when a Water treatment was present, so no definite outcome could be determined. It likely is a result of cooler soil temperatures which slowed the chemical conversion of ammonia to nitrate thus allowing more $\text{NH}_3\text{-N}$ to be emitted.

Nitrous oxide-nitrogen emissions varied greatly in the Control treatment when compared to other treatments. Mean $\text{N}_2\text{O-N}$ emissions were highest in the 20 September 2017 fertilizer application date with mean $\text{N}_2\text{O-N}$ emissions of $1.89 \text{ g N}_2\text{O-N ha}^{-1} \text{ hr}^{-1}$ which was followed by the 1 May 2018 and 12 June 2018 dates with mean emissions of $0.81 \text{ g N}_2\text{O-N ha}^{-1} \text{ hr}^{-1}$, for both dates (Table 2.9). Mean $\text{NH}_3\text{-N}$ emissions were relatively low except during the 22 May 2018 date when mean $\text{NH}_3\text{-N}$ emissions were $1.98 \text{ g NH}_3\text{-N ha}^{-1} \text{ hr}^{-1}$ (Table 2.9). Mean $\text{CO}_2\text{-C}$ emissions were as expected when compared to soil and air temperatures described in Table 2.1.

Table 2.9: Mean N₂O-N, NH₃-N, and CO₂-C emissions over the study period for all treatments and all fertilizer application dates.

Urea & Water Treatment Mean Emissions			
Experiment	N ₂ O-N	NH ₃ -N	CO ₂ -C
	-----g ha ⁻¹ hr ⁻¹ -----		
20 September, 2017	2.01a†	3.45bc	2418.90a
11 October, 2017	0.22c	1.88c	614.00c
1 November, 2017	0.02d	0.22c	360.48d
1 May, 2018	0.63b	6.11ab	1210.66b
22 May, 2018	0.34c	7.09a	1128.25b
p-value	<0.001	<0.001	<0.001
Urea Treatment Mean Emissions			
Experiment	N ₂ O-N	NH ₃ -N	CO ₂ -C
	-----g ha ⁻¹ hr ⁻¹ -----		
20 September, 2017	2.21a	3.04a	2853.23a
11 October, 2017	0.13d	0.19d	511.07d
1 November, 2017	0.02d	0.73cd	429.63d
1 May, 2018	0.60b	2.00b	1329.69b
22 May, 2018	0.09d	0.56cd	975.57c
12 June, 2018	0.35c	1.13c	1009.69c
p-value	<0.001	<0.001	<0.001
Water Treatment Mean Emissions			
Experiment	N ₂ O-N	NH ₃ -N	CO ₂ -C
	-----g ha ⁻¹ hr ⁻¹ -----		
20 September, 2017	1.76a	0.17b	2787.15a
11 October, 2017	0.20b	1.08a	470.47d
1 May, 2018	0.18b	1.40a	843.01c
22 May, 2018	0.10b	0.21b	1363.53b
p-value	<0.001	0.006	<0.001
Control Treatment Mean Emissions			
Experiment	N ₂ O-N	NH ₃ -N	CO ₂ -C
	-----g ha ⁻¹ hr ⁻¹ -----		
20 September, 2017	1.89a	0.02b	3084.92a
11 October, 2017	0.06c	0.22b	493.88d
1 November, 2017	0.02c	0.13b	215.15e
1 May, 2018	0.81b	0.23b	1093.91c
22 May, 2018	0.09c	1.97a	1231.77bc
12 June, 2018	0.81b	0.40b	1317.50b
p-value	<0.001	0.020	<0.001

Urea & Water = 224 kg N ha⁻¹ with supplemental irrigation, Urea = 224 kg N ha⁻¹, Water = supplemental irrigation, Control = no treatment added.

† values within a column and within a treatment that have the same letter are not significantly different at $\alpha = 0.05$

Seasonal Differences

To compare seasonal differences between fertilizer application dates, PLFA samples were analyzed from the 11 October, 2017 and 22 May, 2018 fertilizer application dates. The total biomass was highly variable in the fall and spring and was not significantly different (p-value of 0.149) (Table 2.10). However, seasonal differences in percent bacteria, actinomycetes, arbusular mycorrhizal, and undifferentiated soil organisms were observed (Table 2.10). These finding indicate that from the fall to spring, the relative importance of bacteria decreased as there were more bacteria present in the fall when compared to the spring. This decrease also corresponds to CO₂-C emissions as described above (Table 2.7, Table 2.8).

Table 2.10: Phospholipid Fatty Acid (PLFA) results for the 11 October, 2017 and 12 June, 2018 fertilizer application dates.

Fertilizer Application Date	Total Biomass	Bacteria	Fungi	Actino-mycetes	Arbusular Mycorrhizal	Undiffer-entiated	Fungi/Bacteria
	ng g ⁻¹	-----%					Ratio
11 October, 2017	2360	54.61	10.07	11.75	3.39	34.52	0.18
12 June, 2018	3510	40.78	12.53	7.32	1.28	46.06	0.32
p-value	0.149	0.003	0.481	0.006	0.016	0.025	0.217

In the fall of 2017, CO₂-C and N₂O-N emissions decreased with decreasing soil temperature (Figure 2.1, Figure 2.2). However, different results were observed in the spring of 2018 and soil temperature and emissions were not related. In addition, in the fall there was a strong relationship between N₂O-N and CO₂-C. These findings indicate that the importance of temperature on GHG activity changed from fall to spring. The data suggests that the population change between the fall of 2017 and spring of 2018 played a

major factor in the GHG emissions regardless of treatment or weather characteristics.

Water filled pore space had an important impact on N_2O -N emissions. At higher water filled pore space, N_2O -N emissions increased regardless of season (Figure 2.2).

However, no statistical comparison was performed as water filled pore space and air temperatures both decreased in the fall and the results were confounding. When further comparing seasonal differences, it is important to notice that there was a high nitrate baseline in the spring (Table 2.2). This resulted in the unfertilized treatments having higher N_2O -N emissions than the fertilized treatments (Figure 2.2).

Figure 2.1: Differences in CO₂-C and N₂O-N emissions verses temperature along with the relationship between CO₂-C and N₂O-N for the Fall 2017 and Spring 2018 dates.

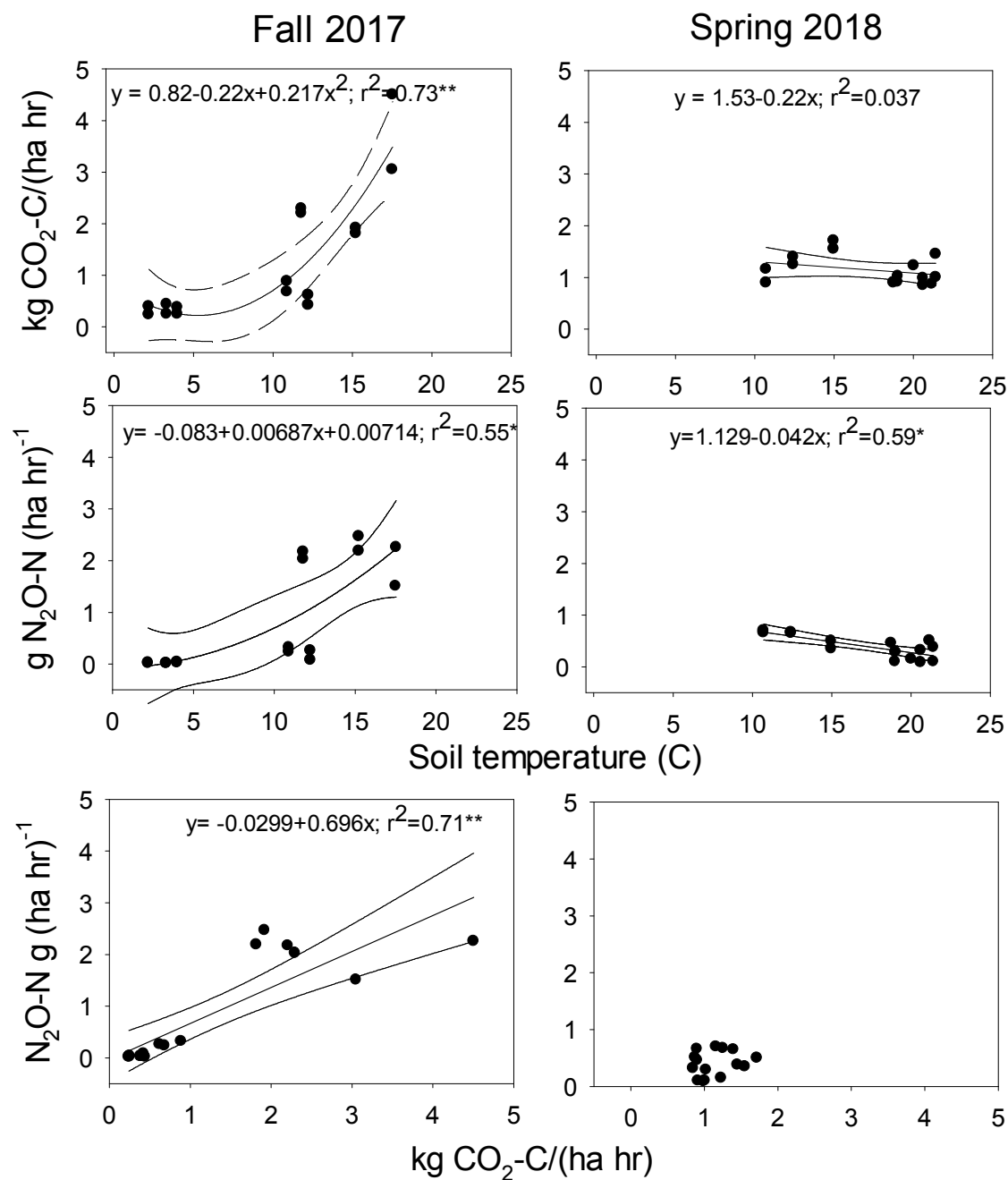
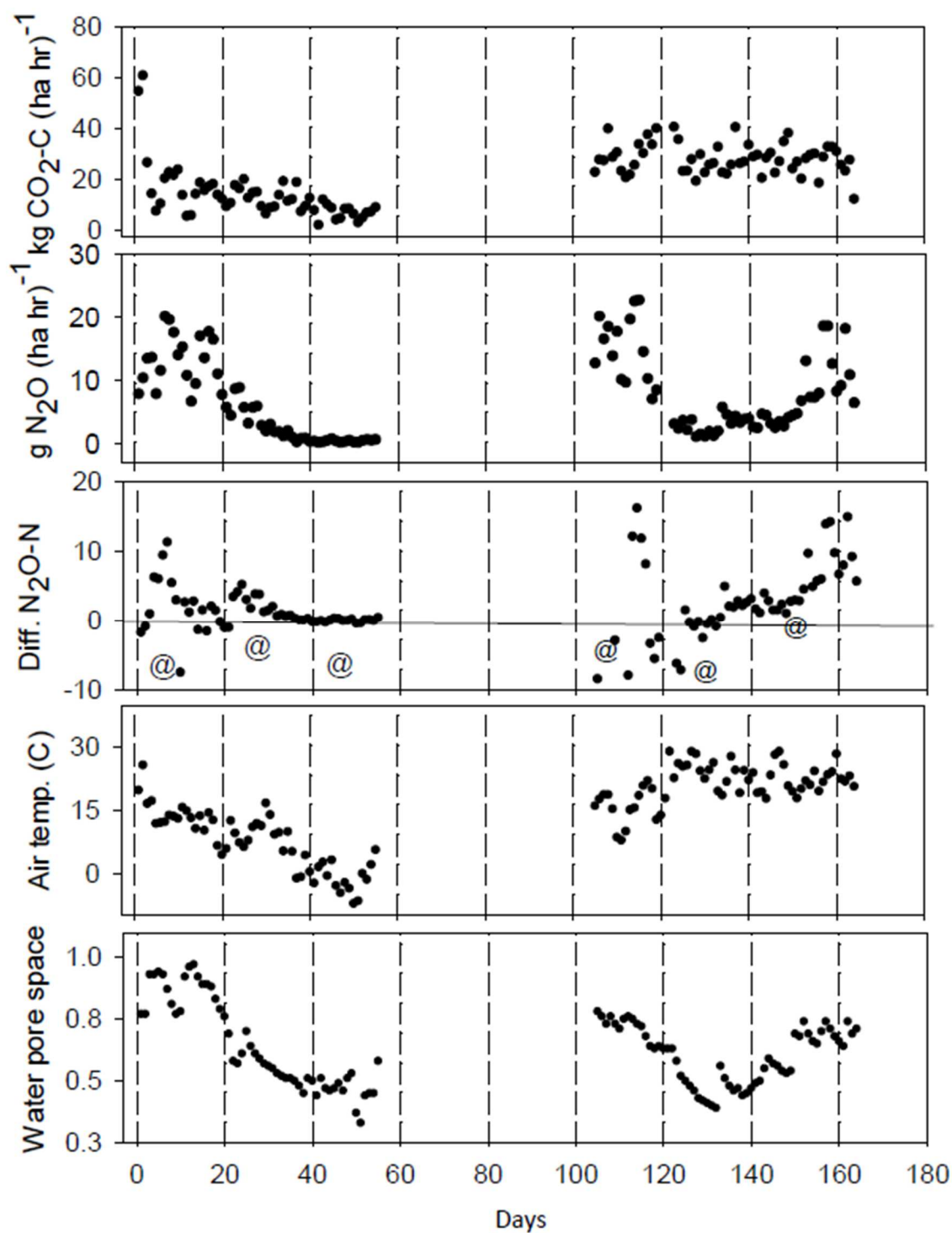


Figure 2.2: Daily mean CO₂-C emissions, N₂O-N emissions, air temperature, and water filled pore space for the fall 2017 and spring 2018 fertilizer application dates. The Fall 2017 fertilizer dates started on 20 September at day 1 and Spring 2018 dates started on 1 May at day 100.



@ = fertilizer application date, Diff. $\text{N}_2\text{O-N}$ = difference in $\text{N}_2\text{O-N}$ emissions from fertilized and unfertilized treatments.

2.5 DISCUSSION

Our study found mixed results with increasing soil moisture contents. This is inconsistent with previous studies where N_2O emissions were responsive to high soil water filled pore space (WFPS) (Dusenbury et al., 2008; Sanju et al., 2010; Sainju et al., 2012). These results may be attributed to N_2O being produced when the soil is aerobic through nitrification and when it is anaerobic through denitrification. The research was not able to identify a definitive WFPS point where N_2O emissions increased, unlike Linn and Duran (1984). It was noticed that the treatments that received nitrogen fertilizer had higher N_2O -N emissions. This is from an increase in substrate which increases nitrification which is the dominant process for N_2O emissions (Mosier et al., 2006; Dusenbury et al., 2008). Our increase in N_2O emissions from fertilizer application was similar to other studies (Sainju et al., 2012; Dusenbury et al., 2008).

In the fall, soil and air temperatures played an important role in N_2O emissions. This is noted during the 11 October 2017 fertilizer application date where N_2O -N emissions decrease drastically between 8-14 DFA and 15-21 DFA. This decrease was aligned with a rapid decrease in soil and air temperatures. The threshold where this sudden drop in N_2O -N emissions occurred was between a five cm soil temperature of 12.2 and 3.99 °C. This is contrary to Holtan-Hartwig et al. (2002) where it was noted that N_2O emissions were elevated near freezing from an inhibition of nitrous oxide reductase. During the 21-day study period for fertilizer applied on 11 October, a peak in N_2O -N emission from the fertilizer application was not observed. Dusenbury et al. (2008) noted that following fertilizer application N_2O emissions peak approximately two to four weeks thereafter. Sainju et al. (2012) reported that nitrogen fertilization increased N_2O

emissions by 43%. Different relationships between the physical measurements of N₂O emissions were observed in the spring. Differences between spring and fall were related to change in the microbial community structure.

Of the six fertilizer application dates, the highest emissions were observed for the 11 September 2017 fertilizer application date. This is consistent with other studies that report that N₂O emissions are greater in fall than in the spring (Drury et al., 2012). However, Dusendury et al. (2008) stated that N₂O-N emissions remain elevated during spring thaw cycles, which could have been a factor in our study. The later spring fertilizer application dates did not result in a decrease in N₂O-N emissions; this would suggest that delaying nitrogen fertilizer application would not decrease N₂O-N emissions. This is similar to results posted by Venterea and Coulter (2015).

Carbon dioxide emissions were not influenced by the application of nitrogen fertilizers. This is consistent with others studies as CO₂ emissions from nitrogen fertilizer application are variable (Al-Kaisi et al., 2008). Sainju et al. (2012) also reported similar results in their multiple year study where CO₂ emissions were higher in the fertilized treatments in 2009 but CO₂ emissions were lower in 2008 and 2011. The application of supplemental irrigation also did not have an effect on CO₂ emissions. This is inconsistent with other studies whereas others have reported that irrigation increased CO₂ emissions as soil water content increased (Sainju et al., 2012). The biggest factor in CO₂-C emissions in this study was soil and air temperatures along with the amount of bacteria in the PLFA soil tests. This is consistent with other studies where CO₂ emissions increased with temperature (Alluvione et al., 2009). Carbon dioxide-carbon emissions were higher in the fall of 2017 when compared to the spring of 2018. This is a result of higher SOC

and bacteria in the fall when compared to the spring samples which had lower SOC and undifferentiated PLFA results.

With these results in mind, we are proposing three conceptual models, based on Drake et al. (2013) to explain seasonal differences. The first model is that a season independent model can be used across seasons. A characteristic of this model is that a common model can be used to define the relationship between temperature or soil moisture in the spring and fall. A good example of this conceptual model is Linn and Doran (1984). The second model that the physical properties do not affect activity and the third model is seasonal differences impact the relationship between soil temperature or moisture and microbial activity. This third model is called seasonal plasticity.

These models were tested by comparing the microbial community structure and GHG emissions of fall and spring samples. Understanding these changes are important because different soil organisms have different processes. Bacteria and fungi have different roles in nutrient cycling in soils. Bacteria fix N, release organic acids to solubilize nutrients, produce siderophores that can chelate iron, and have the capacity to convert ammonium to nitrate, and use nitrate as the final electron acceptor in respiration. Fungi, do not fix N, increase uptake of nutrients through their hyphal network, and produce glomalin that builds soil structure, and have the ability to produce N₂O through denitrification. In addition, fungal and bacterial populations have different impacts on the C and N cycles. For example, fungal biomass may immobilize more N into the microbial biomass than bacterial biomass (de Vries, 2009). Understanding the N immobilization kinetics is important because they have the potential to influence N₂O losses. Following the application of urea, Clay et al. (1990) showed that approximately

one third of the applied N was immobilized directly into the microbial biomass, and that the immobilized N was mineralized faster than the organic N. In the second example, bacterial and fungal populations have different denitrification kinetics. Choel and Delaune (2010) reported that fungi are the dominant organisms producing N_2O in soil with a redox potential of 250 mv, and that bacteria are the dominant organisms in anaerobic systems having redox potential of -200 mv. Bacteria and fungi may also be impacted differently by soil temperature. Pietikalainen et al. (2005) reported that both bacteria and fungi had optimum temperatures between 25 and 30° C. However, bacteria were favored with increasing temperatures and fungi were favored with decreasing temperatures. In our experiment, actinomycetes were higher in the fall than the spring. This change may be important because these organisms are aerobic gram + bacteria that form spores. They produce thread-like filaments and they produce the earthy smell. As aerobic organisms, their capacity to produce N_2O through denitrification is limited. This change in composition suggests that seasonal differences in GHG emissions resulted from changes in the microbial community structure (Rashid et al., 2016). These findings suggest that the seasonal plasticity model may be appropriate for South Dakota.

2.6 CONCLUSION

Nitrous oxide-nitrogen emissions were highest in the 11 September 2017 when soil temperatures were warmest. Nitrogen fertilization did increase N_2O -N and NH_3 -N gas emissions during the majority of fertilization application dates, however, CO_2 -C emissions were not impacted by nitrogen fertilization. Supplemental irrigation increased N_2O -N and NH_3 -N gas emissions but no differences were noticed in CO_2 -C emissions. As soil temperatures decreased CO_2 -C, N_2O -N and NH_3 -N emissions decreased as well.

There was a microbial community change between the fall and spring fertilizer application dates. This change may have attributed differences in the spring and fall N₂O signatures. With this in mind, it is suggested that there a common model between fall and spring GHG emission cannot be used and instead we are proposing a GHG model that changes with the season.

2.7 ACKNOWLEDGEMENTS

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Chapter 3: Nitrous Oxide Emissions Sampling Point Sampling May Not Accurately Predict Emissions Following Fertilizer Application

3.1 ABSTRACT

In crop production, one of the most important greenhouse gases (GHG) is nitrous oxide (N_2O), which is increased by the application of nitrogen (N) fertilizer. However, accurate N_2O emissions measurements are confounded by spatial and temporal variability. This study determined the precision and accuracy of N_2O point measurements following the application of fall and spring applied urea fertilizer. Nitrous oxide emissions, air and soil temperatures, and soil moisture contents were determined for 21 days following the application of $224 \text{ kg urea-N ha}^{-1}$ on 20 September 2017, 11 October 2017, and 1 May 2018, at six time intervals daily (1.5-2.5, 5.5-6.5, 9.5-10.5, 13.5-14.5, 17.5-18.5, and 21.5-22.5 hours). Point samples collected at the average daytime temperature ($T_{\text{ave, heat}}$), between 9.5 and 10.5 hours were inconsistent in their ability to predict N_2O emissions. However, samples collected at the nighttime average temperature ($T_{\text{ave, cool}}$) between 21.5 and 22.5 hours were similar to average emissions. The number of randomly collected point samples to be within 20% of the mean, 80% of the time over the 21 day period ranged from 13 for fertilizer applied on 20 September 2017 to 48 samples for fertilizer applied on 11 October 2017. This research indicates that management and climatic variability affects N_2O emissions, and that accurate sampling protocols vary across management and climates. To reduce uncertainty, point sampling protocols should be tested under the range of conditions likely to be experienced in the field and where possible near-continuous measurement systems should be adopted.

Core comments

1. Measuring N₂O flux at the average daytime temperature did not consistently produce flux estimates that were similar to the near continually measured values for spring and fall applied urea.
2. Locally tested N₂O sampling protocols must account for temporal changes in management, and climatic conditions.
3. Non-alignment in the soil temperature and N₂O emissions patterns is consistent with Fick's Law and can result from delayed N₂O diffusion resulting from the clogging of the soil pores with water.
4. The accuracy of N₂O emissions estimates can be improved by using a near continuous automated measurement systems.

3.2 INTRODUCTION

The carbon footprint provides a single value that represents the consequences from an activity on greenhouse gas emissions (Stone et al., 2012; Lupo et al., 2013; Clay et al., 2012; Butterbach-Bahl et al., 2013). In crop production, two important greenhouse gases are CO₂ and N₂O. Carbon dioxide is released as soil organic matter is mineralized (Clay et al., 2012) and N₂O is released during nitrification, denitrification, and co-denitrification (Chang et al., 2016; Selbie et al., 2015). The carbon footprint is calculated by converting each of these gases to the equivalent amount of carbon dioxide, and based on IPCC (2007); 1 kg of N₂O is equivalent to releasing 298 kg of CO₂. Carbon footprints are used to document the impacts of human activities on global warming and determine if individual products achieve regulatory requirements (California Environmental Agency,

2009). However, the ability to measure greenhouse gas emissions from individual decisions has not kept pace with the need for accurate information.

In annual crop production, carbon footprints generally increase with the amount of N fertilizer applied (Clay and Shanahan, 2011) and decrease with sequestered carbon (Clay et al., 2012). The large carbon footprint associated with N fertilizer results from the large amount of energy used to produce N fertilizer and the impact of N_2O on the ability of the atmosphere to store energy (Klein et al., 2006; Butterbach-Bahl et al., 2013). Nitrous oxide emissions can be separated into at least three processes that include: 1) the production of N_2O by soil organisms, 2) equilibrium relationships between N_2O solubility in water and the amount of N_2O in the air filled pore space, and 3) ultimately N_2O emissions from the soil.

Nitrous oxide is produced during nitrification, denitrification, and co-denitrification (Chang et al., 2016). In aerobic soils, selected soil organisms have the capacity to obtain energy from conversion of ammonia to nitrate. This process, called nitrification is not 100% efficient and small portions of the N are released as N_2O . In anaerobic soils, some soil organisms have the capacity to use nitrate as the terminal electron acceptor in respiration. One of the end products of this process is N_2 ; however a small amount of nitrous oxide is also produced. The conversion of NO_3 to N_2 is called denitrification. The percentage of N converted to nitrous oxide varies across management and soils (Liu et al., 2016). Both processes are influenced by temperature, which can be defined mathematically (Rodrigo et al., 1997; Sharpali et al., 2016).

Once produced, the gas nitrous oxide is contained within the soil solution or the air-filled pore space. The amount contained within the soil solution has been modeled

using Henry's Law, $p = K_H \times c$, where p is the partial pressure of the solute above the solution, c is the concentration in the solution, and K_H is the Henry's Law gas constant. Because, the K_H value is temperature dependent, the Henry's equation indicates that N_2O solubility will decrease with increasing temperature, which in turn should increase its concentration in the air-filled pore space.

The amount of N_2O that is emitted from soil can be estimated using Fick's Law, $F \approx D_s \times \frac{dc}{dz}$, where F is the gas flux, D_s is the soil-gas diffusion coefficient, dc is the concentration gradient, and dz is the change in distance (DeSutter et al., 2008). Increasing the soil moisture content reduces D_s which slows GHG emissions (Moldrup et al., 2000). In addition, D_s may also be function of management, which influences the pore size distribution, crusting, and the length of time required for water to percolate through the soil (Moldrup et al., 2000). For example, Jung et al. (2007) reported that cumulative average water infiltration after two hours was 15 mm in three annually cropped soils and 45 mm in three grassland soils. The increase in infiltration rate in the grassland soils most likely resulted from an increase in the number of large pores, which has the potential to increase D_s (Eynard et al., 2004).

These findings suggest that interactions between microbes, temperature, and water have the potential to influence D_s and GHG emissions. Based on the above discussion, higher temperatures will stimulate microbial respiration and simultaneously reduce N_2O solubility in water. If D_s is large, then it is likely that temperature and GHG emissions will be aligned. Under these conditions, sampling at the average soil temperature may produce accurate GHG emission estimates (Denmead et al., 1979; van der Weerden et al., 2013). Soil with rapid water flow and large soil pores, such as

permeant grasslands are likely to fit this category. The temperature based point sampling approach was adopted by many projects (Williams et al., 1999; Smith and Dobbie, 2001; Parkin and Venterea, 2010; de Klein and Harvey., 2015; Alves et al., 2012; and van de Weerden et al., 2013). However if D_s is small, then emissions and temperature may not be aligned. If temperature and emissions are not aligned, we hypothesize that a GHG sampling protocol based on the average soil temperature will not accurately estimate GHG emissions. Soils containing a large number of small pores and relatively slow saturated hydraulic conductivities may fit this category.

As suggested above, a one-size fits all sampling protocol for GHG may not exist for all soils and management systems. This problem was noted by Parkin and Venterea (2010), where they stated that, “Because of our inability, at this time, to precisely assess the extent of bias associated with a given chamber design and sampling protocol under the range of conditions which might exist, we have adopted our 'best guess' protocol.” The hypothesis of this study was that weekly point measurements of N_2O flux collected at the average air temperature provide the accuracy and precision needed to determine fluxes following fertilizer applications. The objective of this research was to determine the precision and accuracy of point measurements on estimated N_2O emissions following the application of N fertilizer at different seasonal timings.

3.3 MATERIALS AND METHODS

A field study was conducted at the Aurora Research Farm near Aurora, South Dakota (44° 18' 20.57" N, 96° 40' 14.04" W). The soil type was a Brandt silty clay loam (Fine-silty, mixed, superactive, frigid Calcic Hapludolls) (Soil Survey Staff, 2018), with percentage of clay, silt, and sand at 28%, 65%, and 7%, respectively. The initial soil

organic C (SOC) for the surface 15 cm was 36 Mg ha^{-1} , and the carbon mineralization kinetics was previously discussed in Clay et al. (2015). The soil parent materials were loess (0- to 60- cm) over glacial outwash. The surface soil hydraulic conductivity ($k_{sp} = 0.72 \text{ m d}^{-1}$) for this site was previously measured and reported (Clay et al., 1994). The water contents at field capacity and the wilting points were 0.315 and 0.177 g g^{-1} , and soil bulk density (0- to 15- cm soil depth) at the beginning of the study was 1.29 g cm^{-3} . A more complete description of these soils are available in Kim et al. (2008) and Clay et al. (1995, 1996, 2015).

Two long-term opaque chambers (8100-104, LI-COR, Lincoln, NE), that were designed to measure GHG emissions were installed according to LI-COR protocol. Each chamber consisted of a base and cover that pivots to cover the base during sample collection. The bases were only covered when the samples were collected. All chambers were within a 10 m^2 area. During sample collection, the air temperatures within the chambers were measured with a thermistor when the gas samples were collected, a vent was used to equalize the chamber and atmospheric pressures, and the gas within the chamber was mixed. The chambers were sampled sequentially in a designated sequence, and corrections were applied individually to account for the air volume enclosed between the soil surface and the chamber cover. Gas samples were collected from each chamber at a one-second interval for 15 minutes from a 317 cm^2 area. A total of 900 samples were collected and analyzed for N_2O by a Picarro Cavity Ringdown Spectrometer (model G2508; Picarro Inc., Santa Clara, CA). The soil was covered for 15 minutes every four hours. Nitrous oxide flux was calculated from 45 to 900 seconds following chamber closing using the LI-COR SoilFluxPro™ software (ver 4.0.1) (LI-COR, Lincoln, NE).

Soil moisture and temperature for the surface 5 cm were measured using soil moisture (LI-COR 8100-204) and temperature (LI-COR 8150-203) probes.

The Picarro Cavity Ringdown Spectrometer factory calibration was checked with standards at the beginning and end of the experiment. The standards were purchased from Airgas Specialty Gases (Airgas, USA, LLC Cinnaminson NJ), and they had concentrations of 0.378 and 149 ppm. The equation between the standard and the factory calibrations, conducted pre and post experiment was, $y=0.02+1.013 \times (\text{standard})$, $r^2=0.99^{**}$.

In this experiment, urea (224 kg N ha^{-1}) was dissolved in ten mL water and was applied to the soil surface within the long-term chambers. Nitrous oxide-N emissions following the application of urea were measured 6-times daily (1.5-2.5, 5.5-6.5, 9.5-10.5, 13.5-14.5, 17.5-18.5, and 21.5-22.5 hours) for 21 days. These times were selected to match the average, minimum, and maximum soil and air temperatures. This experiment was based on prior research that showed that N_2O emission increase for a relatively short period followed fertilizer applications (Clay et al., 1990b; Omonode et al., 2015; Fujinuma et al., 2011; Fernandez et al., 2016; Thomas and Hao, 2017). The N treatments were applied on 20 September 2017, 11 October 2017, and 1 May 2018. Within a fertilizer application date, each treatment was applied to two chambers. In this experiment, plants were excluded from the study area. For the fertilizer applied on 20 September 2017, emissions were measured from September 22 to October 11. For the fertilizer applied on 11 October 2017, emissions were measured from October 11 to November 1. For the fertilizer applied on 1 May 2018, emissions were measured from May 5 to May 22, 2018. Prior to the experiments, soil samples from two soil increments

(0- to 15- and 15- to 30- cm) were collected from non-treated areas located adjacent to the chambers. At the completion of the study, soil samples were collected from within the study area. Soil samples were dried, ground, sieved and analyzed for inorganic N (Kim et al., 2008). Bulk densities of the sampling depths were determined. A comparison between the N₂O measurements for two chambers were conducted for the three fertilizer application dates. This comparison showed that for the 20 September, 11 October, and 1 May experiments, measurements in the two chambers were highly correlated ($p < 0.01$) to each other and the correlation coefficients between the columns were 0.44, 0.73, and 0.59, respectively.

Data analysis

A fast Fourier transform (FFT) was conducted to identify the magnitudes associated with the dominant frequencies (cycles per day) in the soil surface air temperature and N₂O-N emission measurements (Chang et al., 2017). This analysis used the method summarized by Klingenberg (2005). The N₂O emissions for each time period for the two columns was assumed to represent a four hour time block, which were then summed to determine total emissions or average emissions over the six sampling intervals. Means, variance, confidence intervals, and the sampling requirements for each of the six sampling intervals for the two columns were determined. The average emissions for the six time periods were compared to the average emission across time periods over the 21 days of the experiment.

Within a fertilizer application date, a t- test assuming a common variance was used to compare the average N₂O emissions at each time-period with average emissions over the study period. An F- statistic was used to compare the variances of the different

sampling periods with the variance across all sampling intervals. The estimated random sampling requirements were determined with the Stein equation (Stein, 1945), $n = \frac{t_p^2 \times s^2}{d^2}$ where t_p^2 was the student t- value associated with a specific probability level and degrees of freedom, s^2 was the variance, and d was $\frac{1}{2}$ the total desired range of the mean. Using this equation, the sampling requirement for producing N_2O measurements $\pm 20\%$ and $\pm 30\%$ of the mean 80% of the time ($\alpha=0.2$) were calculated. This equation was previously used to estimate soil sampling requirements (Black, 1992; Skopp et al., 1995; Clay et al., 1997, 2002; Nolan et al., 2006).

The average air chamber temperature during gas sample collection was used to determine the average air temperature during the heating and cooling periods. Soil temperatures generally increased from 600 to 1600 hours and decreased from 1600 to 600 hours. The average temperature of when the soil was warming was identified as $T_{\text{ave, heat}}$ and the average temperature when the soil was cooling was identified as $T_{\text{ave, cool}}$.

3.4 RESULTS AND DISCUSSION

Soil Inorganic N

For the 20 September 2017 fertilizer application date, the initial amount of inorganic N in the soil prior to applying the fertilizer for the 0-to 30- cm was 48.9 kg ha^{-1} . At the completion of the study, the amount of inorganic N in the surface 30- cm was 123 kg N ha^{-1} . For the 20 October 2017 experiment, prior to applying the fertilizer the 0- to 30- cm soil depth contained 65 kg ha^{-1} of inorganic N and at the completion of this experiment, these plots contained 156 kg N ha^{-1} . For the May 1 2018 experiment, the inorganic N in the surface 30 cm prior to the experiment was 39 kg N ha^{-1} . When the

experiment was completed, the soil contained 107 kg N ha^{-1} . The difference between the initial plus the applied N (224 kg N ha^{-1}) and the amount of N remaining in the soil at the completion of the experiment suggests that a large portion of the inorganic N was lost through ammonia volatilization, N_2O emissions, nitrate leaching, microbial immobilization, and fixation (Clay et al., 1990a, 1990b). Immobilization into microbial biomass was identified as the primary loss mechanism because following the application of urea, a large percentage of the applied N is rapidly immobilized into the soil biomass or soil organic matter (Clay et al., 1990b), and measured $\text{NH}_3\text{-N}$ volatilization was very low ($< 3 \text{ g NH}_3\text{-N ha}^{-1}$).

Rainfall and Soil Moisture

Rainfall between September 20 and October 11 was 14.3 cm and rainfall between October 11 and November 1 was 0.51 cm. Rainfall between May 5 and May 20 was 1.63 cm. Between September 20 and October 11, the volumetric water content for the surface five cm depth ranged from 0.35 (68.2 % water filled pore space) to 0.50 g cm^{-3} (98% water filled pore space). Between October 11 and November 1, the volumetric water content for the surface five cm depth ranged from 0.18 (35% water-filled pore space) to 0.42 g cm^{-3} (82% water-filled pore space), and from May 5 to May 22, soil moisture ranged from 0.28 (55% water filled pore space) to 0.37 g cm^{-3} (72% water-filled pore space).

Chamber temperature

Average air temperature within the chamber and soil temperatures (0- to 5- cm) between September 20 and October 11 were 13.5 and 15.2°C , respectively. As expected, the chamber temperatures decreased during the fall and between October 11 and

November 1 the average chamber air and soil temperatures were 7.3 and 9.3 °C, respectively. In the following spring, temperatures increased as the season progressed and the average chamber air and soil temperatures from May 5 to May 22 were 15.6 and 15.6°C, respectively.

The $T_{ave,heat}$ value represents the half-way point between the minimum and maximum temperatures, during a portion of the day when air temperatures were increasing. From 20 September to 11 November 2017, $T_{ave,heat}$ occurred at approximately 10.5 hours (Table 3.1), which was similar to Chang et al. (2016). For the October 2017 and May 2018 experiments, the $T_{ave,heat}$ values were 9.4 and 10.2 hours, respectively.

The $T_{ave,cool}$ values represents the half-way point between the maximum and minimum values during the time of day when air temperatures were decreasing. For the September, October, and May experiments, $T_{ave,cool}$ occurred at 22.3, 22.0, and 22.2 hours, respectively (Table 3.1). In the USDA-ARS GRACnet protocols (Parkin and Venterea, 2010) the $T_{ave,heat}$ and $T_{ave,cool}$ values should correspond to the values reported as mid-morning and early evening, respectively. The $T_{ave,heat}$ occurred at approximately mid-morning, however $T_{ave,cool}$ was much later than early evening.

Table 3.1: The mean, median, standard deviation, and confidence interval for air temperatures for each fertilizer application period. Times are reported in a decimal form.

9/20/2017 to 10/11/2017	Air Temperature		
	$T_{ave,heat}$	$T_{ave,cool}$	Daily
	hours	hours	°C
Mean	10.54	22.34	13.45
Median	9.63	21.63	12.21
St dev	2.043	1.86	6.98
95% CI	1.06	0.82	1.38

10/11/2017 to 11/1/2017	Air Temperature		
	$T_{ave,heat}$	$T_{ave,cool}$	Daily
	hours	hours	°C
Mean	9.35	22	7.27
Median	9.7	21.7	5.71
St dev	1.79	1.97	8.22
95% CI	0.786	0.86	1.47

5/1/2018 to 5/22/2018	Air Temperature		
	$T_{ave,heat}$	$T_{ave,cool}$	Daily
	hours	hours	°C
Mean	10.18	22.18	15.6
Median	10.18	22.18	13.37
St dev	1.51	1.51	7.65
95% CI	0.765	0.765	1.56

Diurnal and season pattern

For the three fertilizer application dates, air temperatures and N_2O emission's followed diurnal cycles. Air temperature and N_2O emissions data and the resulting fast Fourier Transformation (FFT) were shown in Figures 3.1 and 3.2. The frequency is the number of cycles per day, and the magnitude represents the dominance of that frequency. The FFT is an analytical approach for inspecting data for repeating cycles. Frequencies with large magnitudes indicate that frequency has a large impact on measured data. For example in Figures 3.1 and 3.2, large magnitude associated with the one cycle per day

frequency indicated that the chamber air temperature and N₂O-N emissions measurements were influenced by a diurnal cycles. However, data sets can also contain low and high frequency cycles. The low frequency temperature and N₂O emissions FFT's were attributed to gradual temperature and emissions decreases as the season progressed.

Figure 3.1: An example of the mathematical conversion of air temperature (top) to the frequency domain (bottom) using a fast Fourier Transformation. The data used in this example was collected between September 20 and October 11. The FFT shows that the data set contains both long (small frequency) and diurnal cycles (frequency 1). The long cycle was attributed to the gradual cooling of the soil. The magnitude in the FFT represents the importance of that frequency. The average volumetric soil moisture contents for September 20 to October 11 time period was $0.42 \text{ cm}^3 \text{ cm}^{-3}$.

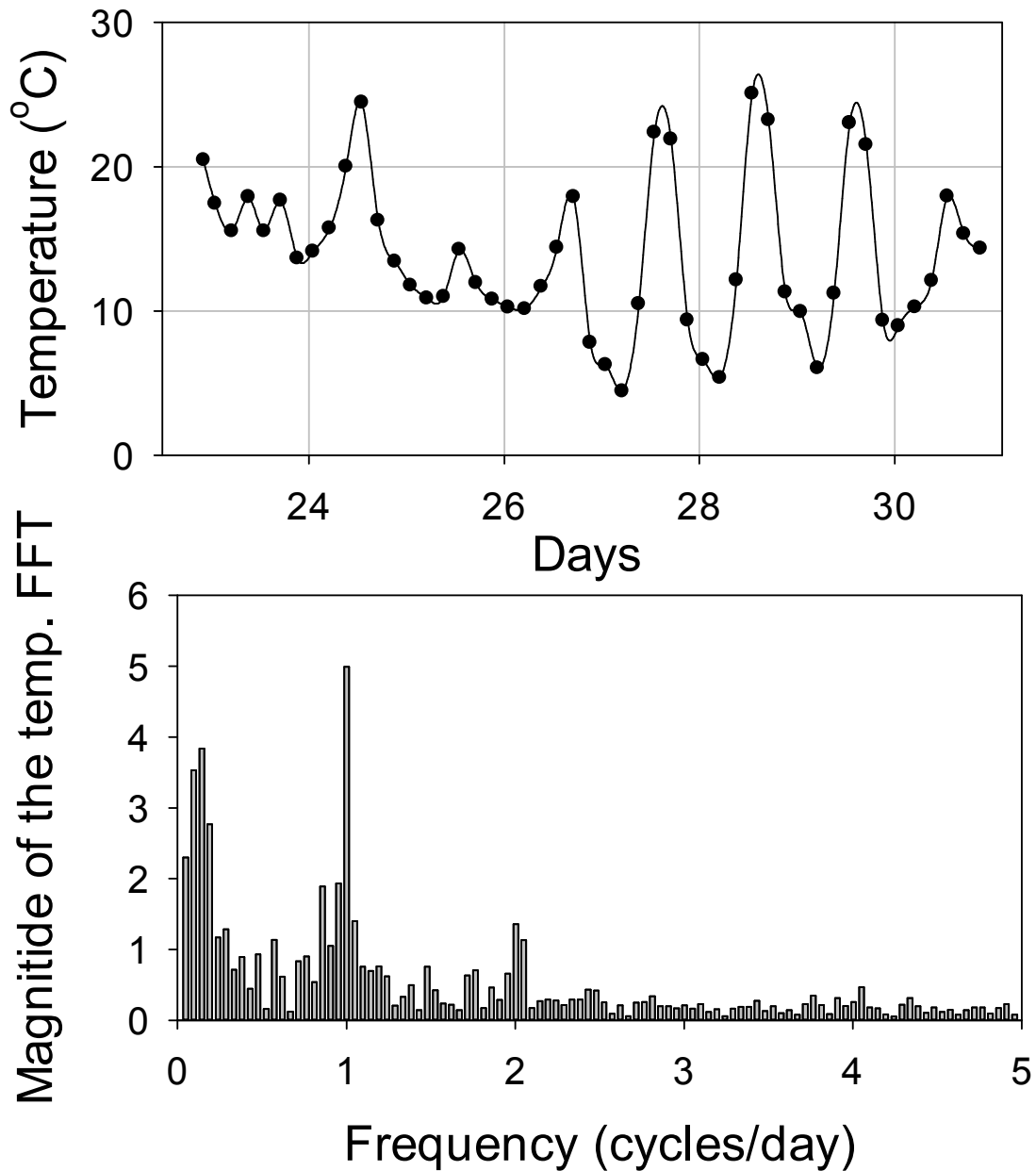
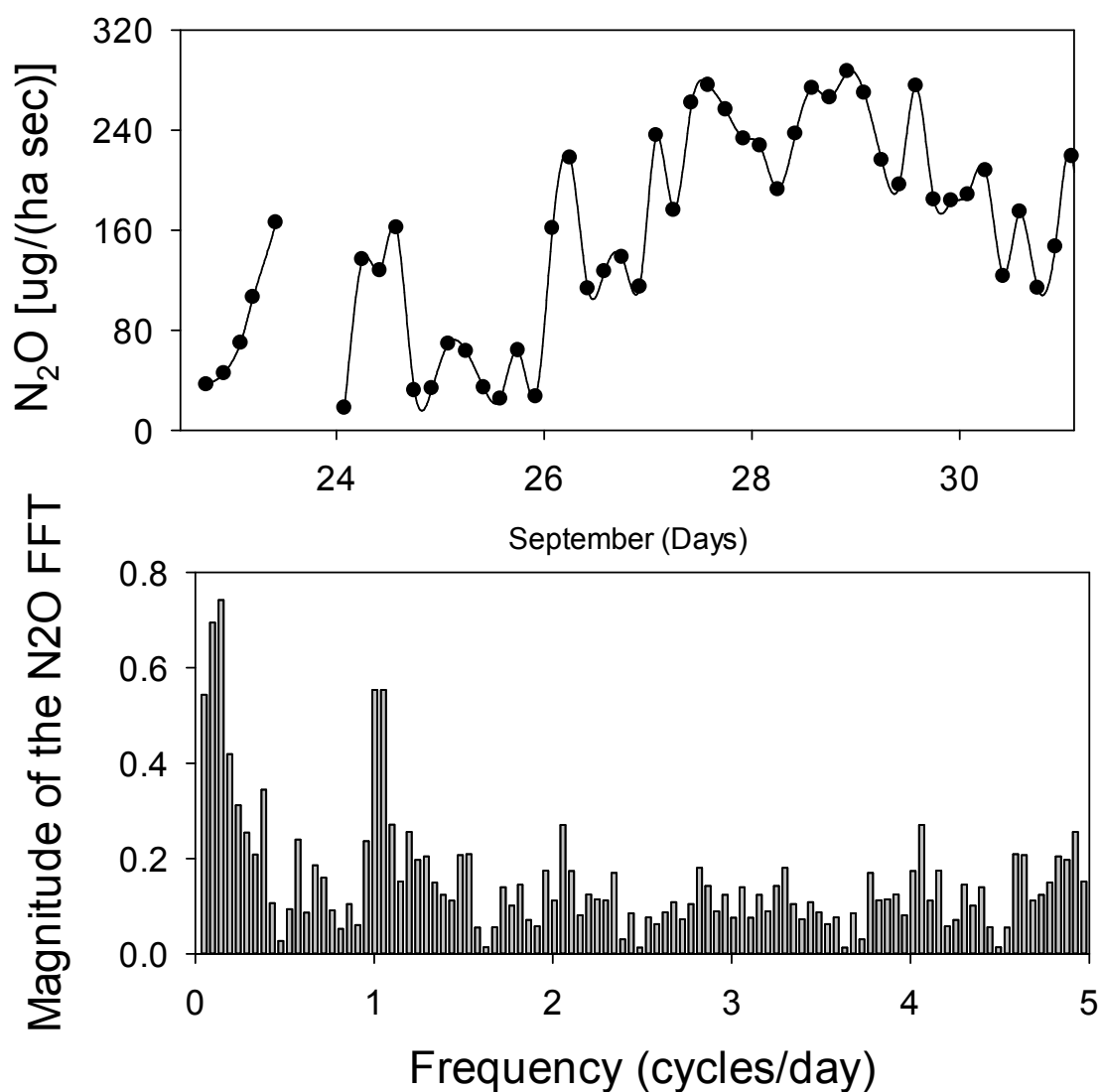


Figure 3.2: An example of the mathematical conversion of N_2O emissions (top) to the frequency domain (bottom) using a fast Fourier Transformation. The data used in this example was collected between September 20 and October 11. During this period, N_2O was measured every four hours. The FFT frequency (bottom) shows that there were important patterns in the data set. The high magnitudes for small frequencies indicate long-term trends in the emissions pattern. The large magnitude for the frequency of one indicates that a strong diurnal pattern existed in the collected data.



Emission signatures

For the fertilizer applied on 20 September 2017, the maximum N₂O-N emissions and air temperatures generally occurred between 13.5 and 14.5 hours (Table 3.2). However, there were important exceptions when temperature and N₂O emissions were not aligned (Figures 3.3 and 3.4). In the first example, during the time-period between September 28 and September 30, N₂O peaks were delayed relative to the temperature peak (Figure 3.3). The shift in the N₂O emission peak results in a similar shift in the optimum sampling time. As predicted by Fick's Law, this delay could result from a reduced soil-gas diffusion coefficient resulting from increasing soil moisture contents or crusting (Clay et al., 1990a; DeSutter et al., 2008; Balaine et al., 2013). The non-alignment between temperature and emissions peaks was not permanent and by 2 October 2017, temperatures and emissions were closely aligned.

It is likely that the length time where temperatures and emissions are not aligned will depend on the soils water flow characteristics. In well drained soils with high water infiltration rates this shift may be very short. For example, in research reported by van de Weerden (2013) on well drained perennial grassland that had a low bulk density (0.96 g cm⁻³), they recommended that sampling at the average temperature between 10.0 and 12.0 hours had zero bias. The comparison of findings from studies with different physical characteristics is important because they suggest that the length of the N₂O phase shift will depend on the soils physical and biological characteristics.

For the 20 September 2017 fertilizer application date, the median $T_{\text{ave,heat}}$ value was at 9.6 hours (Table 3.1), and if samples were collected between 9.5 and 10.5 hours

total emissions would have been underestimated by 18% (Table 3.2). For the 11 October 2017 fertilizer application date, the N₂O emission peak occurred between 17.5 and 18.5 hours, and the minimum value occurred between 9.5 and 10.5 hours. Point sampling at $T_{ave,heat}$ would have underestimated total N₂O emissions by 31%.

In the second example, the impact of soil moisture on N₂O emissions for spring applied N was explored (Fig. 3.4). This relationship showed that emissions decreased rapidly with an increase in soil water content from 0.32 to 0.36 cm³ cm⁻³ on 11 May 2018. This decrease could be attributed to several factors including a decrease in diffusivity resulting from an increase in the water-filled pore space or decreased nitrification. Emissions remained relatively low until 13 May, and from 13 May to 16 May, water contents gradually decreased to 0.32 cm³ cm⁻³ and diurnal N₂O emission cycles were again evident in the data set. These results are contrary to the perception that denitrification increases with increasing water saturation, and it highlights the importance of considering that emissions, diffusivity, and microbial activity represent different components of a complex system. For the 1 May 2018 fertilizer application date, maximum emissions occurred between 13.5 and 14.5 hours, and samples collected between 13.5 and 14.5 hours over-estimated emissions by 26% (Table 3.2). Minimum emissions occurred between 1.5 and 2.5 hours and underestimated emissions by 22% (Table 3.2). It is important to point out that for this fertilizer application date, gas samples collected between 9.5 and 10.5 hours, which included $T_{ave,heat}$ were similar to total emissions. Temperature dependence in N₂O emission patterns is not new and has been reported by others (Burzaco et al., 2013; Chang et al., 2016).

Figure 3.3: Nitrous oxide emissions, air temperatures, and soil moisture for urea applied on 20 September 2017. Values in the top chart are from September 28 to 30. Data in the bottom chart are from October 2 to October 7. In the top chart, the N₂O peak was delayed relative to chamber air temperatures. In the bottom chart, the air temperature and N₂O peaks were becoming more aligned. The average soil moisture content from September 27 to October 3 was 0.45 cm³ cm⁻³. The average soil moisture content from October 3 to October 10 was 0.42 cm³ cm⁻³.

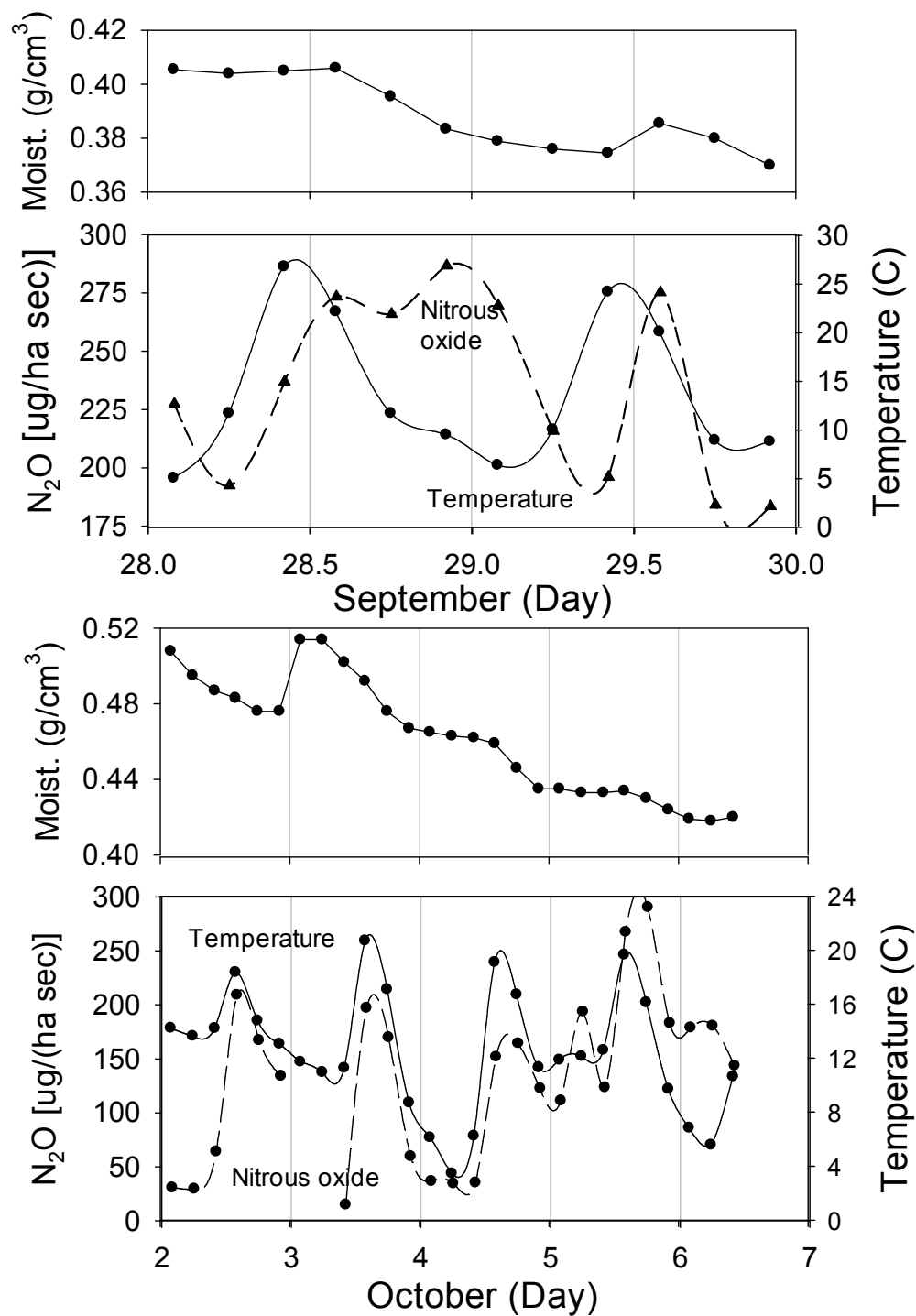


Figure 3.4: Nitrous oxide emissions and volumetric soil moisture contents from 9 May to 18 May. Soil water increased from 0.32 to 0.36 g cm^{-3} from a rainfall event. Associated with the soil water increases was a decrease in N_2O emissions.

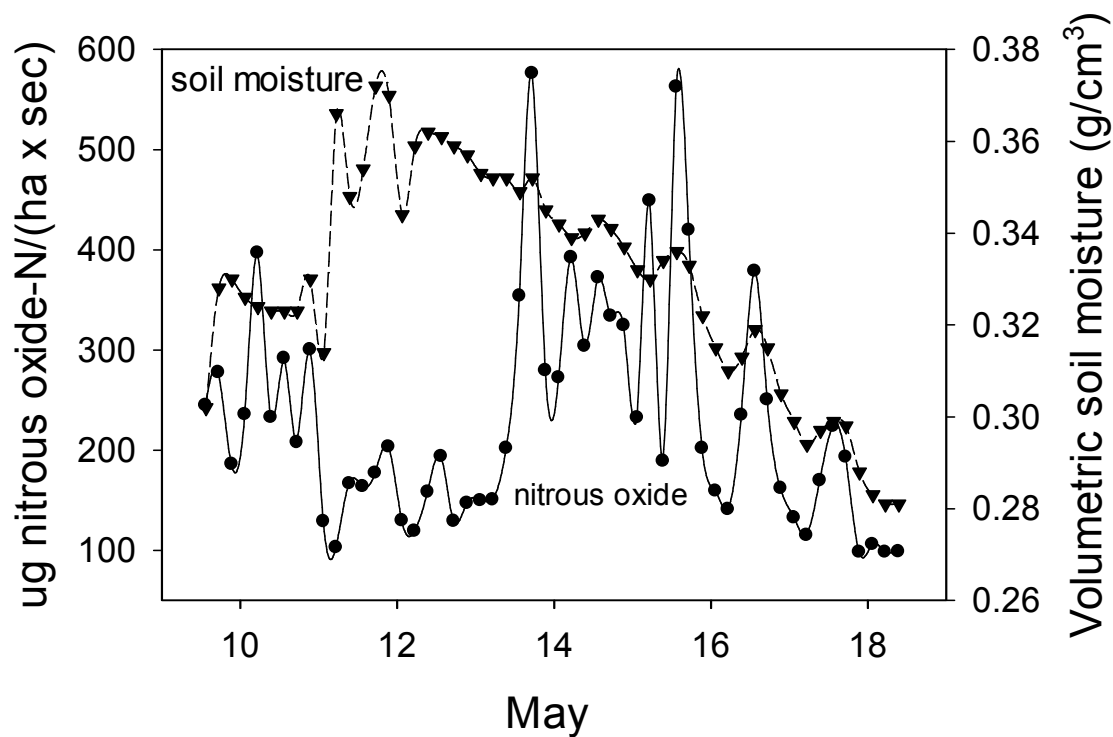


Table 3.2: The influence of sampling time on the mean and variance of the measured N₂O-N emissions. The sampling requirements for the estimated values to be within 20 or 30% of the mean 80% of the time were calculated using the Stein (1945) equation.

9/20/2017		-----N ₂ O-N-----				Estimated Sampling Requirement ($\alpha=0.2$)	
Hours	Temp.	Mean	90% CL	Variance	n		
	°C	ug(ha sec) ⁻¹				20% mean	30% mean
1.5-2.5	9.8	135.6	21.2	6,672	40	16	9
5.5-6.5	8.8	126.9 _t	18.5	4,694 _t	37	13	6
9.5-10.5	11.8	120.6*	17.5	4,290 _t	38	13	6
13.5-14.5	19.2	186.9*	22.4	7,033	38	9	4
17.5-18.5	17.5	176.2*	21.2	5,791	35	8	4
21.5-22.5	11.1	148.8	23.3	7,807	39	15	7
All	13.2	149	8.8	6,557	227	13	6

10/11/2017		-----N ₂ O-N-----				Estimated Sampling Requirement ($\alpha=0.2$)	
Hours	Temp.	Mean	90% CL	Variance	n		
	°C	ug(ha sec) ⁻¹				20% mean	30% mean
1.5-2.5	3.4	36.5	11.1	1,768	39	57	25
5.5-6.5	2.3	26.1 _t	4.61	291**	37	19	9
9.5-10.5	7.6	25.1 _t	6.29	556**	38	38	17
13.5-14.5	14.2	41.1	11.78	2,155 _t	42	35	16
17.5-18.5	11.8	52.4*	12.68	2,260 _t	38	35	16
21.5-22.5	5.1	37.5	9.99	1,511	41	46	21
All	7.5	36.67	4.15	1,497	235	48	21

5/1/2018		-----N ₂ O-N-----				Estimated Sampling Requirement ($\alpha=0.2$)	
Hours	Temp.	Mean	90% CL	Variance	n		
	°C	ug(ha sec) ⁻¹				20% mean	30% mean
1.5-2.5	10.3	129.5 _t	18.8	4,170**	32	11	5
5.5-6.5	9.2	146.3	30.2	10,480	31	21	10
9.5-10.5	16.1	149.5	23.7	6,667**	32	13	6
13.5-14.5	22.5	225.0*	40.8	18,483 _t	30	16	7
17.5-18.5	22.6	202.4 _t	43.8	22,703*	32	24	11
21.5-22.5	14	134.9	22.1	5,783**	32	14	6
All	15.8	166.4	13.8	13,336	190	21	2

_t, *, ** the reported value for a sampling time interval is different from the average emissions across all sampling times at the 0.1, 0.05, and 0.01% level, respectively.

Sampling requirement

For fertilizer applied on 20 September 2017, samples collected between 9.5 and 10.5 hours had variances that were similar or lower than samples collected across all sampling times (Table 3.2). For this fertilizer application date, the Stein (1945) equations predicted that 13 randomly collected samples over 21 days were required to estimate N_2O emissions to within 20% of the mean, 80% of the time. For fertilizer applied on 11 October, 48 and 21 samples, were required to be within 20 and 30% of the mean 80% of the time, respectively (Table 3.2). For fertilizer applied on 1 May, 21 and two samples were required to within 20 and 30% of the mean 80% of the time, respectively (Table 3.2).

These results differ from Parkin (2008), where sampling every three days resulted in flux measurements that were within 10% of expected value. Differences between our results and Parkin (2008) were attributed to the data processing method. Parkin (2008) determined daily emissions by averaging the four values measured within a 24 hour period. These samples were collected at 6.0, 12.0, 18.0, and 24.0 hours. It is important to note that if this sampling protocol missed peak emissions (14 to 16 hours), then total daily emissions were underestimated. Parkin (2008) then resampled this constructed data set to estimate the seasonal sampling requirement. The Parkin (2008) analysis approach was tested using data provided in this paper. As expected, this analysis showed that by averaging the six values collected daily reduced calculated sampling requirement by 38%.

These findings must be considered based on several findings from other studies. First, N_2O emissions are highest following fertilizer application which is followed by

rapid declines (Thomas and Hao, 2017). Samples collected at different times may have difference variances associated with them. For example, samples collected for the 21 days after the 20 September 2017, 11 October 2017, and 1 May 2018 fertilizer application dates had a variances of 6,557, 1,497, and 13,336, respectively (Table 3.2). All of these variances were significantly different. It is likely that similar temporal differences in the variance structure occur in point samples collected at regular intervals across multiple seasons. Second, total annual emissions over a season are estimated using the equation, $\int_0^{365} f_{(N_2O,t)}$, which can be solved using a number of approaches. One approach is solve the equation, $\sum_1^{26} N_2O_t$, where N_2O_t are the individual emission values the individual time periods when the samples are collected. A second approach is to use a linear model to estimate losses between two sampling points. Regardless of the approach used to aggregate temporal data, it is important to be aware of underlying assumptions. Many statistical methods assume homogeneity of variance and there are consequences (Ott and Longnecker, 2016) of having inconstant variance. These include inaccurate parameter estimates, invalid statistical tests, and interval estimates that are either too wide or narrow depending on an experimental region with low or high variance.

3.5 CONCLUSION

The hypothesis for this paper was that weekly point measurements of N_2O flux collected at the average air temperature, as suggested by several papers provides the accuracy and precision needed to determine fluxes following fertilizer applications. In this study, sampling between 9.5 and 10.5 hours, which contained the median $T_{ave, heat}$ value for the three fertilizer application dates, underestimated N_2O -N emissions for two

of the three application dates. These results were attributed to reduced diffusivity resulting from increased soil moisture or that the surface soil was dispersed. For example, an increase in the volumetric soil water content from 0.32 to 0.36 cm³ cm⁻³ on 11 May (Figure 3.4) resulted in rapid decline in N₂O-N emissions. When the soil dried, a large increase in emissions was observed. These results are contrary to the perception that denitrification increases with increasing water saturation, and it highlights the importance of considering that N₂O emissions can be separated into at least three components; production, solubility, and emissions. Each of these components can be described mathematically and are impacted by temporal changes in temperature and moisture. The research findings indicate that in cropped systems, point sampling at $T_{ave,heat}$ can lead to uncertainty in calculated emissions. However, different results were observed for $T_{ave,cool}$.

This study also considered how often samples need to be collected. Protocols suggested by Parkin and Venterea (2010), Alves et al. (2012), van de Weerden et al. (2013), and de Klein et al. (2015) suggest that sample timing could range from daily to several times a week. Based on the Stein (1945) equation, GHG sampling twice a week would have resulted in six samples collected over the 21 time period. Based on data provided in Table 3.2, collecting six samples was less than the sampling requirement for the estimated values to be within 20% of mean 80% of the time for all three fertilizer application dates. Additional characteristics that should be considered when assessing reliability of the calculated measurement are provided by Rochette and Eriksen-Hamel (2008). These considerations include the absence of absolute reference gas, the lack of

consistent chamber deployment time, variation in the number of air samples collected, and variation in the type of mathematical model to estimate emissions.

Alternative sampling approaches to improve reliability might include the adoption of near continuous measurements of temporal and spatial changes in GHG, temperature, water filled pore space, and GHG diffusivity (Balaine et al., 2013). Advantages of continuous sampling of a mixed system are that complex relationships among soils, climate, management, GHG emissions, and plants can be defined (Sharpali et al., 2016). Chamber induced impacts on GHG emission estimates can be minimized (Venterea et al., 2009), and that temporal changes in GHG fluxes are resolved.

If continuous measurement systems are not adopted, locally based protocols need to be tested for precision and accuracy. If all studies use unique sampling protocols and do not provide detailed information on temporal changes in soil moisture and temperature a meaningful meta-analysis of the published findings would be difficult to conduct (Balaine et al., 2013). For example, in South Dakota, Lehman and Osborne (2016) collected gas samples at approximately 10.00 h, whereas in Indiana, Owens et al. (2017) collected samples between 10.00 and 12.00 h. In Colorado, Halvorson and Del Grosso (2012) collected samples in midmorning, and in Minnesota, Venterea and Coulter (2015) collected samples between 10.00 and 13.00 hours.

In conclusion, N₂O-N emissions and air chamber temperatures generally followed diurnal cycles. However, this was not the case following climatic perturbations. These results were important because they suggest that during a time-period of high N₂O emissions, temperature-based sampling protocols may or may not produce accurate estimates of total emissions. Accurate N₂O estimates require a sampling system that

accounts for temperature induced diurnal cycles, as well as changes in GHG fluxes following climate and management perturbations. To interpret emission signatures, detailed information on temporal changes in soil moisture, bulk density, and temperature are needed. Many studies do not provide this information. This lack of information when combined with flux differences between point and continuous measurement systems results in uncertainty in the published findings (Weitz et al., 1999; Smith and Dobbie, 2001). These findings are conceptually in agreement with Barton et al. (2015).

3.6 ACKNOWLEDGEMENTS

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Chapter 4: Future Research

4.1 GENERAL

This thesis looked at using enhanced efficiency fertilizers (EEF), different application timings, different moisture regimes, and applying nitrogen fertilizers during different seasons of the year. The cost associated with analyzing greenhouse gas (GHG) emissions, specifically nitrous oxide, is relatively expensive and this results in smaller experiments and less replications. An automated system provides more measurements but the cost is high, however, a manual system has low cost but measurements are typically limited to only a few due to available labor and sample analysis cost. These studies used an automated sampling system with almost exclusively two replications due to the cost of the equipment. This limited the treatments to four because only eight chambers were available. While GHG could be monitored six times a day, the limited number of treatments resulted in a huge knowledge gap and researchers should collaborate to reduce the knowledge gap on GHG emissions.

4.2 NITROGEN STABILIZERS

It was determined that Environmentally Smart Nitrogen (ESN) and urease coated urea (NBPT) were effective in reducing N_2O emissions in controlled laboratory conditions. This study should be replicated in field conditions to see if the results are consistent. The study could also include different fertilizer sources such as, but not limited to; anhydrous ammonia, urea ammonia nitrate (UAN), and manure. Also, different nitrogen stabilizers could be applied such as nitrapyrin or dicyandiamide (DCD). The use of polymer coated nitrogen fertilizers to reduce GHG gas emissions also

requires more data observations. Enhanced efficiency fertilizers could provide a management strategy for reducing N_2O emissions in different soils and different climates without compromising yield.

4.3 CONVENTIONAL FERTILIZER APPLICATION

Conventional nitrogen fertilizers (example: Urea, UAN, Anhydrous Ammonia) will continue to be used as a major source of nitrogen based fertilizers. However, different management strategies should be implemented to reduce GHG emissions. This study looked at the effects of soil moisture, soil temperature, and different application timings. It was determined that soil moisture had some impact on N_2O -N and CO_2 -C emissions. Also, the same was noticed for soil temperature. The biggest factor that was researched in this study in reducing GHG emissions was the different fertilizer application dates, specifically the impacts of spring vs. fall fertilizer applications. This was a result of a microbial community change. To further this research, nitrogen based fertilizers should be applied as frequent intervals (example: every week) throughout the growing season and Phospholipid Fatty Acid (PLFA) samples should be collected to determine and monitor if a microbial community change occurs throughout the growing season. Altogether, the impact of microbial communities on GHG emissions requires advanced technologies to fully understand the complex nature of GHG's.

Another management option to reduce nitrogen loss in agriculture is the use of cover crops, also known as catch crops and green manure. These crops, if managed properly, could scavenge up excess nitrogen from previous nitrogen applications and convert the nitrogen into an organic form. This will likely reduce potential leaching and volatilization losses. The cover crops can also be used to decrease erosion potential,

suppress undesirable plants, and decrease soil bulk density all of which are favorable for plant development.

APPENDIX A

Supplemental Table 1: Phospholipid Fatty Acid (PLFA) results for the 11 October, 2017 and 12 June, 2018 fertilizer application dates.

Fertilizer Application Date	Treatment	Biomass ng g ⁻¹	Bacteria %	Fungi %	Protozoan %	Undifferentiated %
11 October, 2017	Urea	2500	54.70a†	10.95	0.82	33.54
	Control	2230	54.54a	9.20	0.77	35.51
12 June, 2018	Urea	2750	39.71b	11.14	0.62	58.54
	Control	4260	41.85b	13.92	0.65	43.58
	p-value	0.223	0.019	0.829	0.967	0.076

Urea = 224 kg N ha⁻¹, Control = no treatment added.
† values within a column that have the same letter are not significantly different at $\alpha = 0.05$

Supplemental Table 2: Average soil NO₃-N and NH₄-N test values for all six fertilizer application dates, treatments, and sample depths.

Supplemental Table 2. Average soil NO ₃ -N and NH ₄ -N test values for all six fertilizer application dates, treatments, and sample depths.									
Fertilizer Application Date	Treatment	NO ₃ -N				NH ₄ -N			
		0-15 cm	15-30 cm	30-45 cm	45-60 cm	0-15 cm	15-30 cm	30-45 cm	45-60 cm
		-----kg NO ₃ -N/ha-----				-----kg NH ₄ -N/ha-----			
20 September, 2017	Start	20.5	13.9	-	-	10.2	4.41	-	-
	Urea & Water	122	34.9	18.1	10.3	24.7	15.0	22.0	12.9
	Urea	63.3	21.6	13.2	20.1	22.1	15.1	12.08	9.2
	Water	10.2	5.52	2.61	7.22	17.6	15.5	11.09	13.1
	Control	14.5	3.25	3.69	7.18	18.7	12.8	13.06	12.4
11 October, 2017	Start	32.2	7.05	4.81	3.04	6.19	1.98	12.35	10.0
	Urea & Water	34.0	10.3	26.2	7.31	9.57	4.32	61.30	5.45
	Urea	24.6	20.0	6.70	4.20	190	13.3	1.78b	3.50
	Water	9.22	13.7	6.90	13.6	22.2	61.8	3.25b	6.62
	Control	9.11	10.8	3.37	13.6	3.67	22.5	4.42	2.43
1 November, 2017	Start	18.7	7.08	5.11	4.83	14.9	20.3	6.17	6.64
	Urea & Water	42.8	11.3	5.98	2.30	154	8.54	4.16	0.00
	Urea	36.4	11.2	5.79	2.51	128	6.06	6.46	0.00
	Control	17.8	8.77	5.82	5.34	11.6	1.48	3.09	3.82
1 May, 2018	Start	18.1	8.02	3.64	3.50	4.72	4.98	3.74	2.07
	Urea & Water	69.3	8.56	2.86	1.73	18.3	10.8	8.07	7.92
	Urea	70.0	6.08	2.32	3.45	26.1	9.97	9.43	8.35
	Water	7.59	1.67	1.70	2.14	12.1	9.09	12.56	9.44
	Control	9.37	5.20	2.44	1.94	12.7	13.7	14.90	12.3
22 May, 2018	Start	1.95	1.67	1.33	1.41	15.2	14.7	9.85	9.43
	Urea & Water	96.6	20.1	8.27	3.80	13.6	10.7	9.91	11.4
	Urea	83.3	15.2	5.83	4.15	49.6	12.2	8.90	9.27
	Water	21.4	11.1	3.92	2.37	9.93	13.5	12.56	12.1
	Control	10.5	5.24	2.19	1.45	8.48	10.4	9.19	9.09
12 June, 2018	Start	30.7	11.8	5.07	2.95	7.64	10.5	9.29	12.2
	Urea	90.1	25.4	11.9	5.25	25.3	14.3	14.98	14.6
	Control	13.5	9.07	6.16	2.85	19.7	13.4	14.6	12.5

Urea & Water = 224 kg N ha⁻¹ with supplemental irrigation, Urea = 224 kg N ha⁻¹, Water = supplemental irrigation, Control = no treatment added.

Supplemental Table 3: Percent NO₃-N and Total available inorganic N for each fertilizer application date and treatment for the 60 cm soil depth.

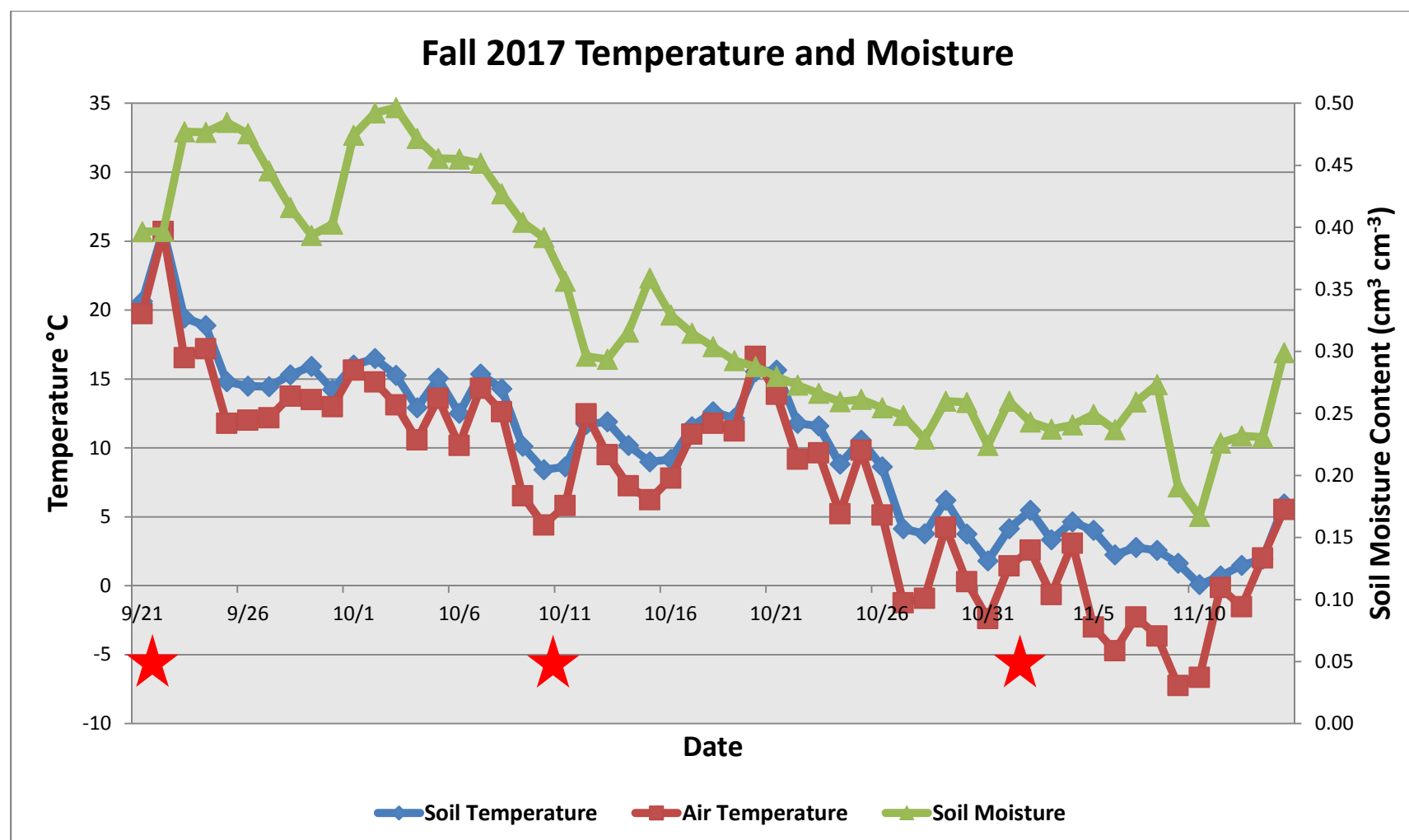
20 September, 2017	0 to 60 cm		1 May, 2018	0 to 60 cm	
	NO ₃ -N	Total N		NO ₃ -N	Total N
Treatment	%	kg ha ⁻¹	Treatment	%	kg ha ⁻¹
Start	-	-	Start	68.22a	48.81b
Urea & Water	71.06a	259.82a	Urea & Water	64.66a	127.56a
Urea	66.83a	176.60b	Urea	60.23a	135.65a
Water	30.03b	82.86c	Water	24.29b	53.80b
Control	33.55b	82.51c	Control	23.11b	72.65b
p-value	0.004	0.002	p-value	0.026	0.018

11 October, 2017	0 to 60 cm		22 May, 2018	0 to 60 cm	
	NO ₃ -N	Total N		NO ₃ -N	Total N
Treatment	%	kg ha ⁻¹	Treatment	%	kg ha ⁻¹
Start	60.65	77.65	Start	11.47	55.46b
Urea & Water	53.42	158.45	Urea & Water	72.92	174.35a
Urea	21.63	264.39	Urea	57.51	188.43a
Water	38.61	137.26	Water	43.62	86.90b
Control	57.24	69.95	Control	30.20	56.52b
p-value	0.454	0.181	p-value	0.106	0.020

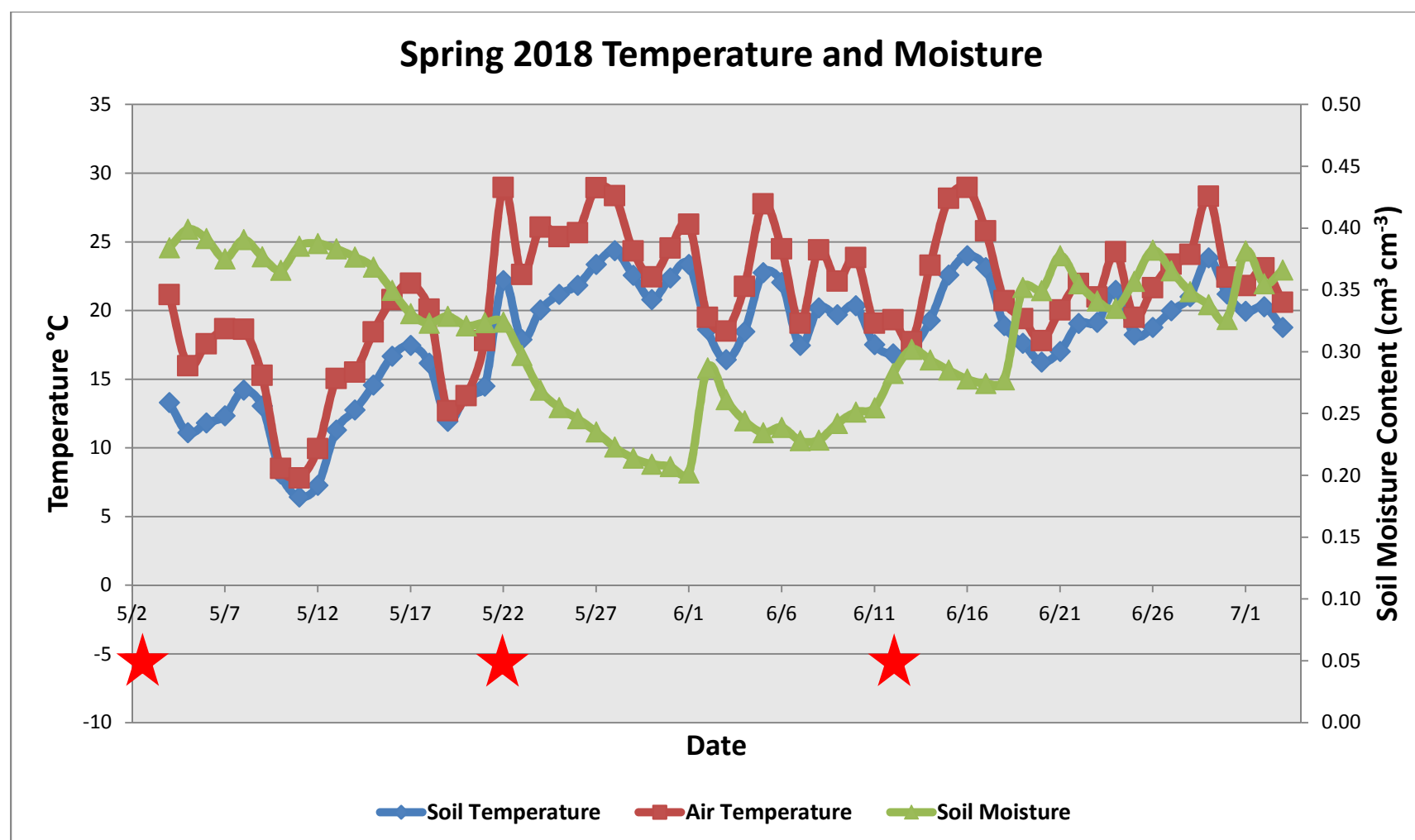
1 November, 2017	0 to 60 cm		12 June, 2018	0 to 60 cm	
	NO ₃ -N	Total N		NO ₃ -N	Total N
Treatment	%	kg ha ⁻¹	Treatment	%	kg ha ⁻¹
Start	42.66b	83.76bc	Start	55.98ab	90.12b
Urea & Water	27.56c	226.52a	Urea & Water	-	-
Urea	28.69c	194.37ab	Urea	65.10a	201.81a
Water	-	-	Water	-	-
Control	65.32a	57.73c	Control	23.97b	91.87b
p-value	0.009	0.047	p-value	0.044	0.025

Urea & Water = 224 kg N ha⁻¹ with supplemental irrigation, Urea = 224 kg N ha⁻¹, Water = supplemental irrigation, Control = no treatment added.

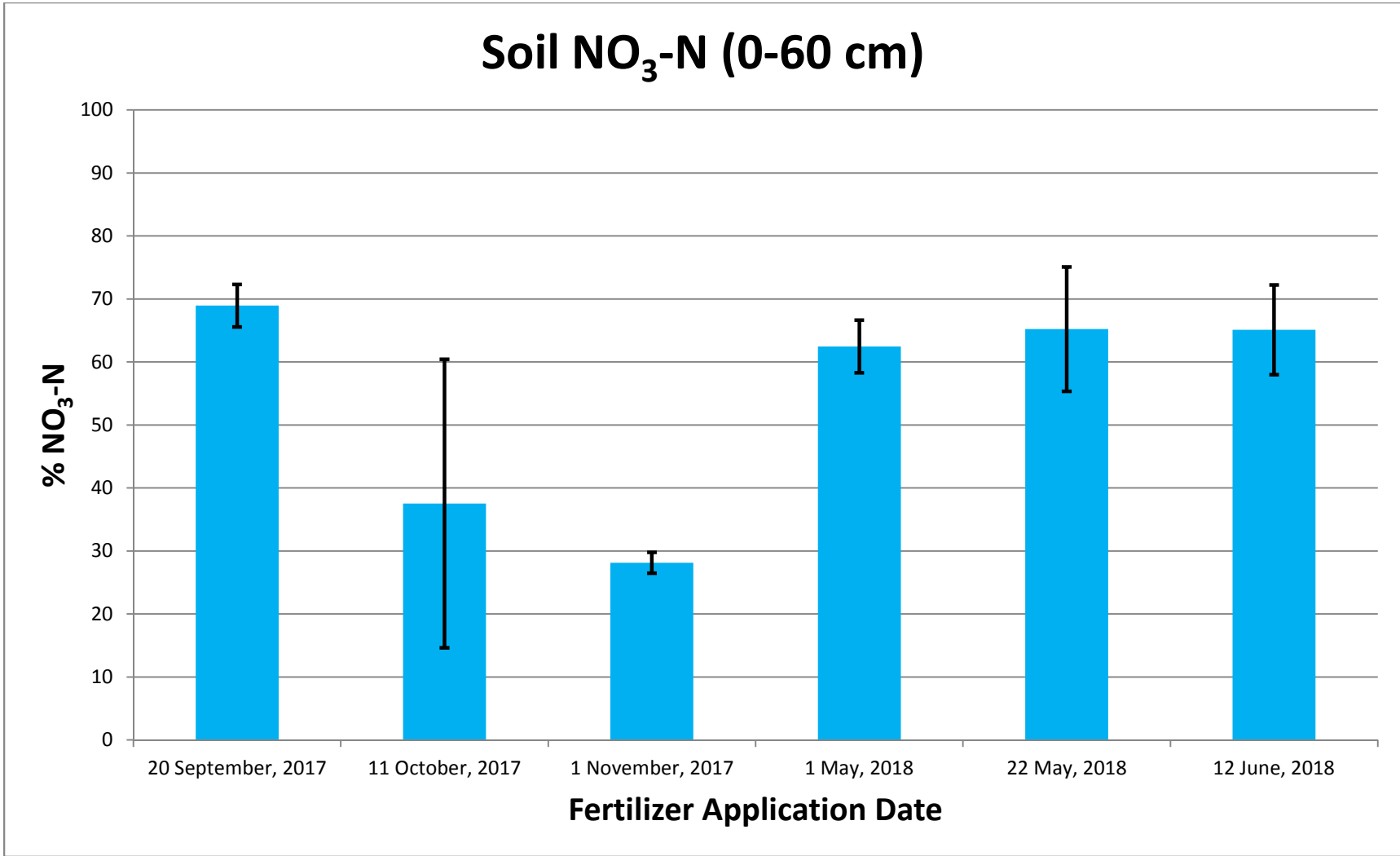
Supplemental Figure 1: Fall 2017 soil and air temperatures along with natural soil moisture content. The red stars coincide with each fertilizer application date.



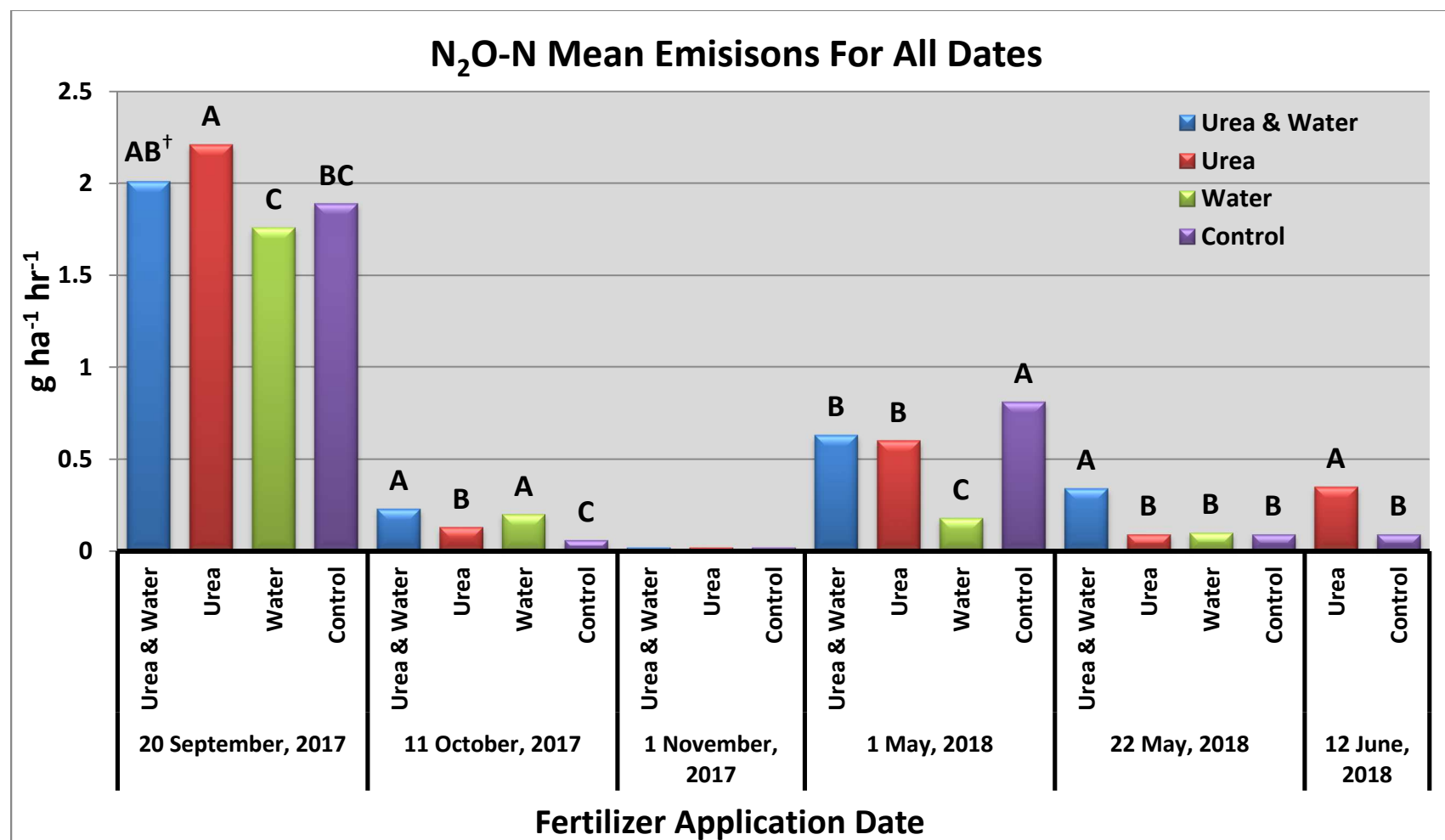
Supplemental Figure 2: Spring 2018 soil and air temperatures along with natural soil moisture content. The red stars coincide with each fertilizer application date.



Supplemental Figure 3: Soil percent nitrate in the 0- to 60- cm soil depth for the Urea and Urea & Water treatments for all fertilizer application dates. The error bars are the 95% confidence interval.

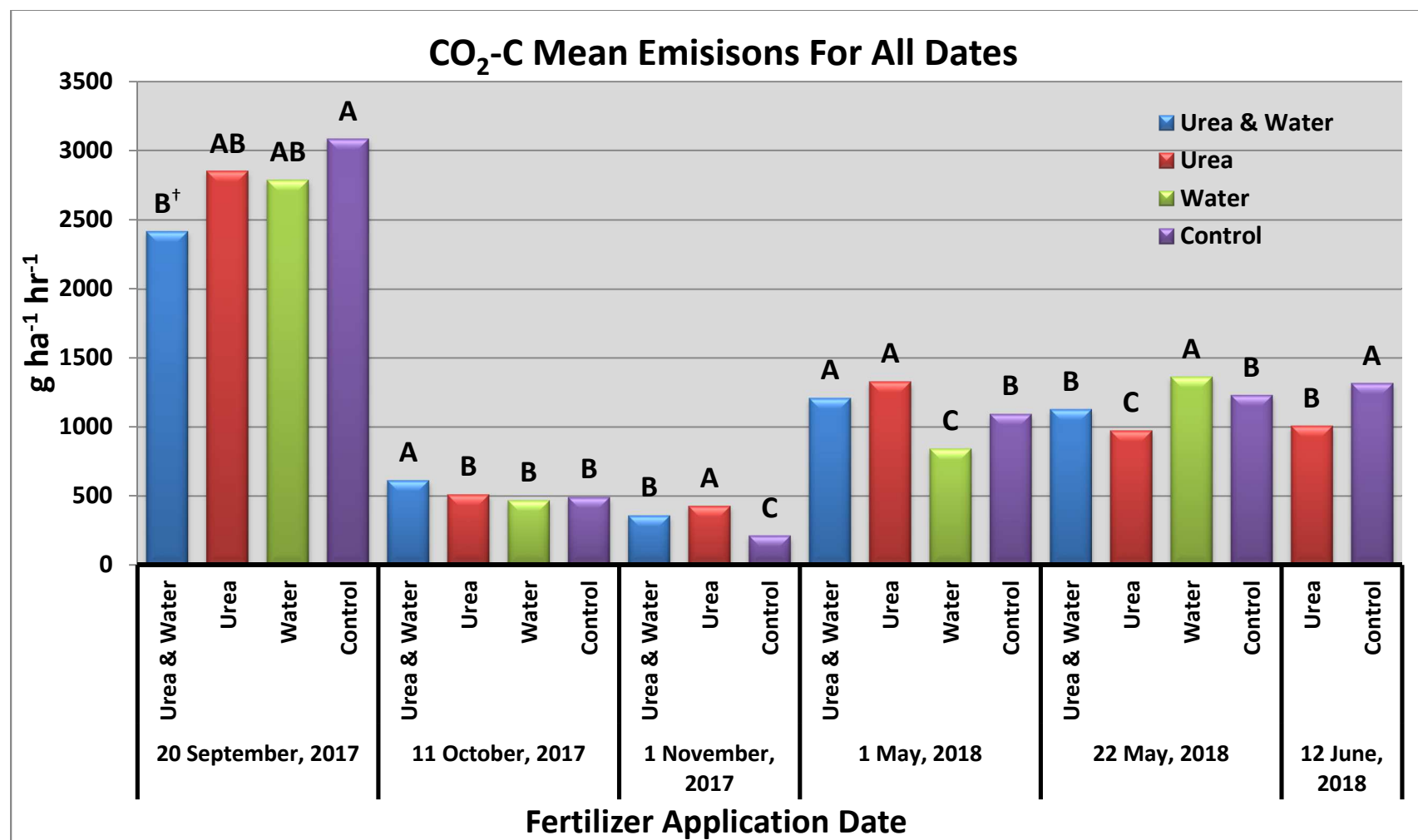


Supplemental Figure 4: Mean nitrous oxide (N₂O-N) emissions for all treatments and all fertilizer application dates.



Urea & Water = 224 kg N ha⁻¹ with supplemental irrigation, Urea = 224 kg N ha⁻¹, Water = supplemental irrigation, Control = no treatment added.

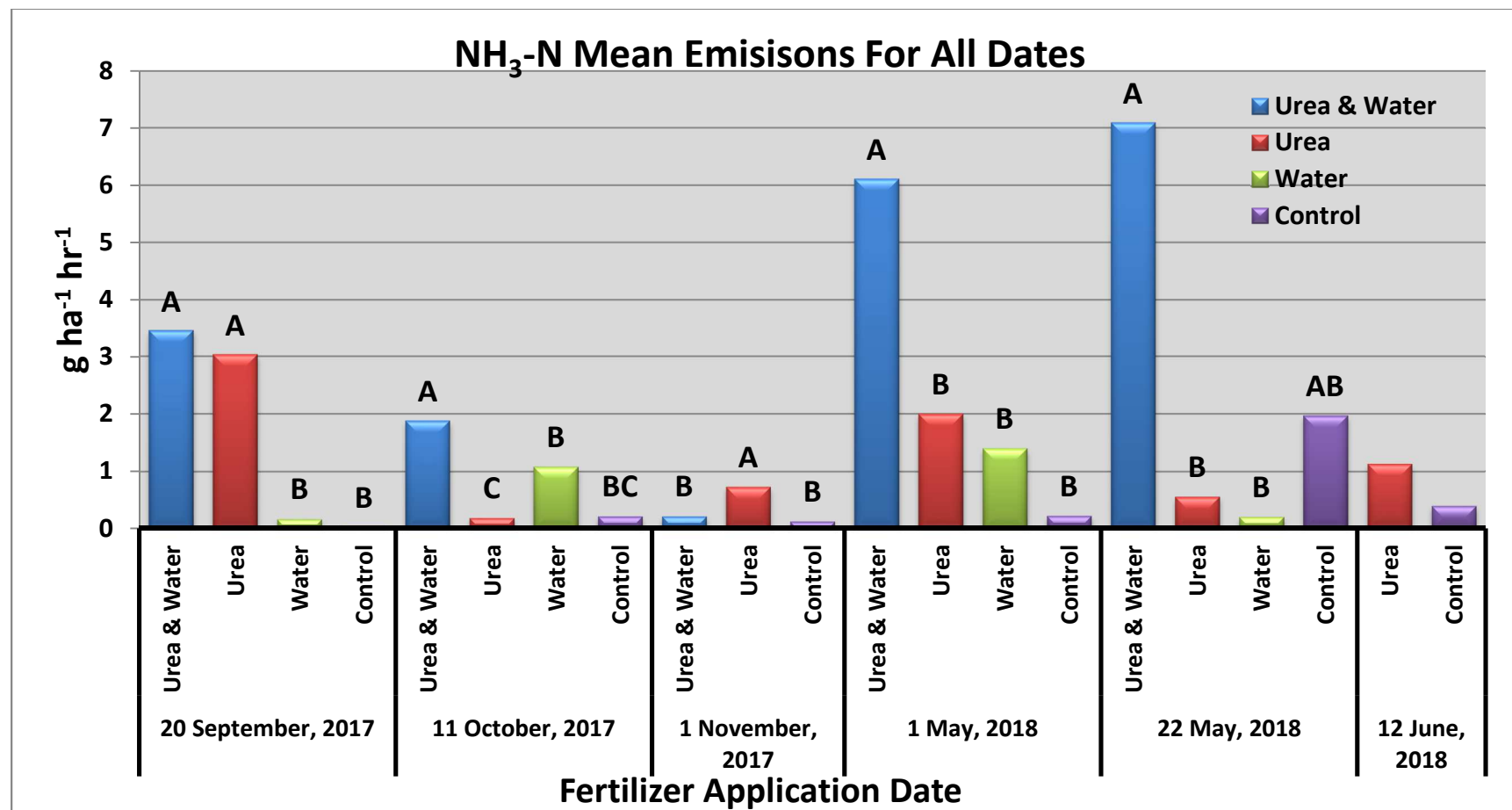
[†] values within a fertilizer application date that have the same letter are not significantly different at $\alpha = 0.05$

Supplemental Figure 5: Mean carbon dioxide (CO₂-C) emissions for all treatments and all fertilizer application dates.

Urea & Water = 224 kg N ha⁻¹ with supplemental irrigation, Urea = 224 kg N ha⁻¹, Water = supplemental irrigation, Control = no treatment added.

[†] values within a fertilizer application date that have the same letter are not significantly different at $\alpha = 0.05$

Supplemental Figure 6: Mean ammonia ($\text{NH}_3\text{-N}$) emissions for all treatments and all fertilizer application dates.



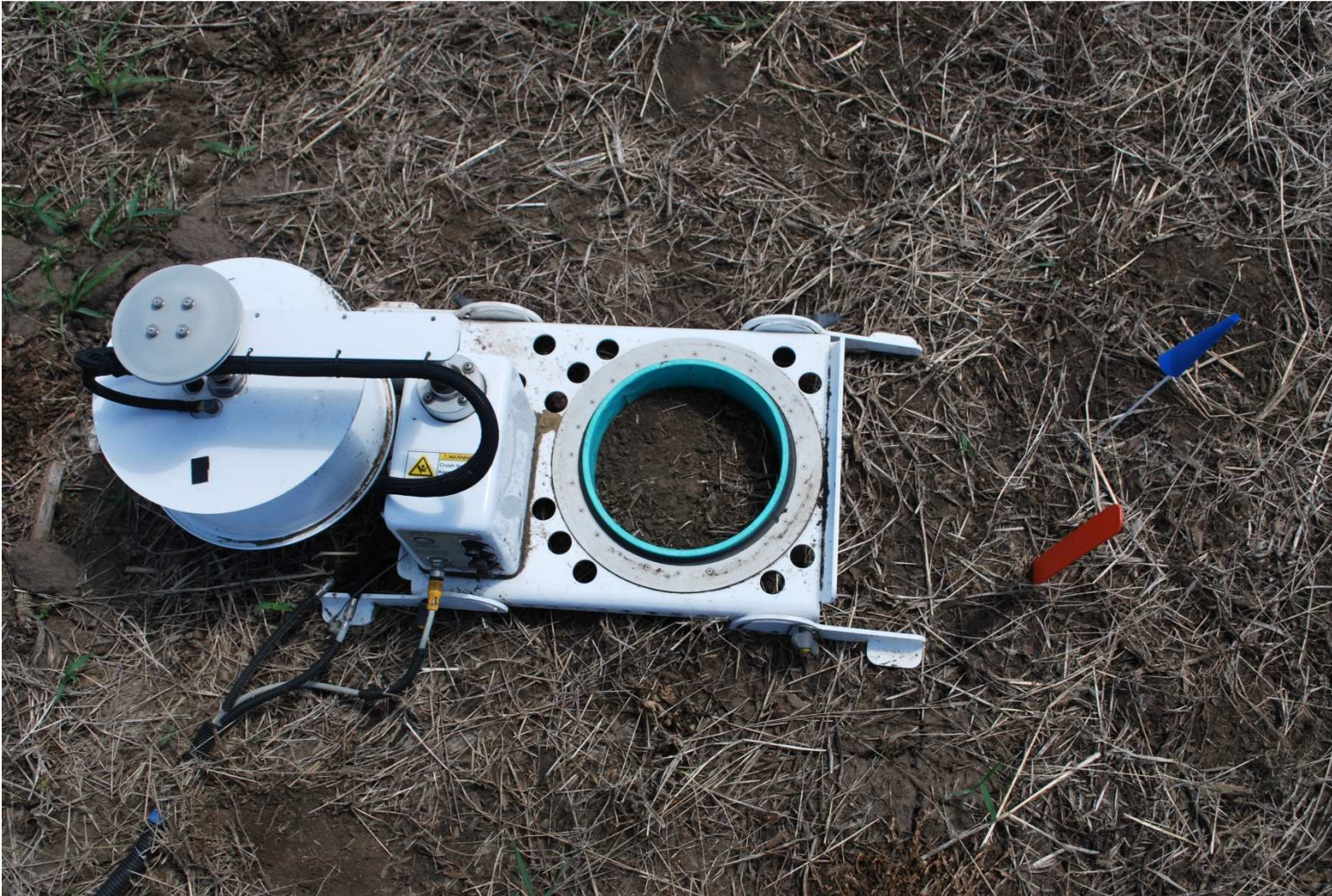
Urea & Water = 224 kg N ha^{-1} with supplemental irrigation, Urea = 224 kg N ha^{-1} , Water = supplemental irrigation, Control = no treatment added.

† values within a fertilizer application date that have the same letter are not significantly different at $\alpha = 0.05$

Supplemental Picture 1: Pictured below is the LI-COR LI-8100-104 long term chambers in the field. The meter PVC square was used for soil sampling during the experiment without disturbing the soil in the chambers.



Supplemental Picture 2: A LI-COR LI-8100-104 long term chamber from an aerial view. The blue PVC ring inside of the chamber was inserted into the soil five cm.



Supplemental Picture 3: The LI-COR LI-8150 16 port multiplexer. This multiplexer switched gas samples automatically.



Supplemental Picture 4: This picture shows the inside of the weatherproof trailer. The LI-COR LI-8150 multiplexer is located in the lower right side, the Picarro Cavity Ringdown Spectrometer is located center, and a backup battery and surge protector are located underneath the table.



Supplemental Picture 5: This picture shows the application of the urea fertilizer in the field to the LI-COR LI-8100-104 long term chambers. The urea fertilizer was dissolved in water before application.



APPENDIX B

Appendix B contains the raw calculated flux and soil parameters. These values were used in Chapters 2 and 3. A complete description of how these values were collected and calculated can be found in the materials and methods section of Chapter 2.

List of Variables in APPENDIX B:

ID #:	Identification number
Date & Time:	Date and time at start of sampling
Run:	Fertilizer application date; 1 = 20 September 2017, 2 = 11 October 2017, 3 = 1 November 2017, 4 = 1 May 2018, 5 = 22 May 2018, 6 = 1 June 2018
A Tmp:	Air temperature (°C)
S Tmp:	Five cm soil temperature (°C)
N Mst:	Natural rainfall soil moisture five cm depth (cm ³ cm ⁻³)
NS Mst:	Natural rainfall plus supplemental irrigation soil moisture five cm depth (cm ³ cm ⁻³)
Trt:	Treatment applied; U = Urea, UW= Urea & Water, W= Water, C= Control
N ₂ O-N:	N ₂ O-N emissions in g N ₂ O-N ha ⁻¹ hr ⁻¹
CO ₂ -C:	CO ₂ -C emissions in g CO ₂ -C ha ⁻¹ hr ⁻¹
NH ₃ -N:	NH ₃ -N emissions in g NH ₃ -N ha ⁻¹ hr ⁻¹

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1	9/22/2017 0:26	1	21.97				W	2.30	9042.2	
2	9/22/2017 0:43	1	21.80		0.38		C	1.44	7763.8	
3	9/22/2017 1:00	1	21.86				C	1.98	8373.1	
4	9/22/2017 1:17	1	21.71	22.05	0.42		W	0.57	10120.2	
5	9/22/2017 1:33	1	21.76				UW	0.64	12535.9	25.76
6	9/22/2017 1:50	1	22.80				U	1.56	10024.4	22.76
7	9/22/2017 2:07	1	21.88				UW	0.78	8617.1	
8	9/22/2017 2:24	1	21.98		0.36		U	0.59	12833.7	15.39
9	9/22/2017 4:25	1	21.63				W	2.52	9252.0	
10	9/22/2017 4:42	1	21.52		0.38		C	1.56	8396.6	
11	9/22/2017 4:59	1	21.66				C	2.29	8925.0	
12	9/22/2017 5:16	1	21.49	21.77	0.41		W	0.62	9770.8	
13	9/22/2017 5:32	1	21.50				UW	0.59	11807.8	30.14
14	9/22/2017 5:49	1	22.25				U	1.69	9911.6	29.96
15	9/22/2017 6:06	1	21.56				UW	1.67	8217.6	
16	9/22/2017 6:23	1	21.62		0.36		U	1.88	11836.7	23.15
17	9/22/2017 8:25	1	22.42				W	1.01	10035.9	
18	9/22/2017 8:42	1	22.61		0.38		C	0.83	8129.1	
19	9/22/2017 8:59	1	22.72				C	1.45	9738.3	
20	9/22/2017 9:16	1	23.50	23.06	0.41		W	0.75	12316.2	
21	9/22/2017 9:32	1	24.78				UW	2.39	15523.5	59.27
22	9/22/2017 9:49	1	25.97				U	2.77	11901.7	48.92
23	9/22/2017 10:06	1	25.77				UW	2.11	10027.4	
24	9/22/2017 10:23	1	25.38		0.36		U	1.79	15935.1	38.54
25	9/22/2017 10:50	1	27.07				UW	2.54	16455.8	45.75
26	9/22/2017 11:06	1	27.84				U	2.74	11737.5	60.61
27	9/22/2017 11:23	1	29.46				W	1.24	9481.1	
28	9/22/2017 11:39	1	30.71		0.38		C	1.53	8604.2	
29	9/22/2017 12:45	1	32.79				W	2.18	10213.6	0.74
30	9/22/2017 13:02	1	33.63		0.38		C	1.60	8743.0	
31	9/22/2017 13:18	1	33.37				C	2.28	10222.7	
32	9/22/2017 13:35	1	34.29	32.08	0.42		W	0.92	17183.1	
33	9/22/2017 13:51	1	34.24				UW	0.76	15278.0	62.39
34	9/22/2017 14:08	1	32.60				U	2.58	8701.0	22.12
35	9/22/2017 14:24	1	34.48				UW	2.32	9649.2	
36	9/22/2017 14:41	1	35.15		0.36		U	1.25	16657.2	19.44
37	9/22/2017 16:45	1	33.26				W	2.38	12022.1	
38	9/22/2017 17:02	1	33.12		0.37		C	2.41	9112.5	
39	9/22/2017 17:18	1	33.20				C	2.36	11106.4	
40	9/22/2017 17:35	1	31.11	31.65	0.41		W	1.57	18258.9	
41	9/22/2017 17:51	1	29.30				UW	0.65	12055.1	15.06
42	9/22/2017 18:08	1	29.24				U	2.62	7430.1	11.40

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
43	9/22/2017 18:24	1	27.91				UW	2.30	8258.0	
44	9/22/2017 18:41	1	23.39		0.36		U	0.53	17556.5	7.70
45	9/22/2017 20:45	1	22.83				W	0.57	4297.2	
46	9/22/2017 21:02	1	22.65		0.47		C	2.15	7160.1	
47	9/22/2017 21:18	1	21.55				C	2.60	3919.0	
48	9/22/2017 21:35	1	21.08	24.18	0.49		W	0.69	2479.7	
49	9/22/2017 21:51	1	20.73				UW	0.39	5355.5	0.16
50	9/22/2017 22:08	1	20.52				U	2.78	7794.9	8.60
51	9/22/2017 22:24	1	20.16				UW	0.59	2042.9	
52	9/22/2017 22:41	1	19.79		0.47		U	0.66	5212.8	3.87
53	9/23/2017 0:15	1	19.28				W	2.01	2396.9	
54	9/23/2017 0:32	1	18.44		0.47		C	3.09	6400.4	
55	9/23/2017 0:48	1	18.26				C	3.13	3297.6	
56	9/23/2017 1:05	1	18.07	21.36	0.49		W	1.78	4638.4	
57	9/23/2017 1:21	1	17.71				UW	2.47	6780.6	2.79
58	9/23/2017 1:38	1	16.92				U	5.21	10256.4	12.66
59	9/23/2017 1:54	1	17.15				UW	1.31	2457.7	
60	9/23/2017 2:11	1	16.87		0.46		U	1.01	5780.6	3.99
61	9/23/2017 4:15	1	16.66				W	1.74	2005.2	
62	9/23/2017 4:32	1	16.51		0.46		C	2.77	6288.1	
63	9/23/2017 4:48	1	16.69				C	3.03	2980.3	
64	9/23/2017 5:05	1	16.70	19.45	0.48		W	2.24	3051.9	
65	9/23/2017 5:21	1	15.91				UW	2.36	5543.3	6.81
66	9/23/2017 5:38	1	14.73				U	3.21	6964.7	6.52
67	9/23/2017 5:54	1	15.11				UW	1.11	2614.0	
68	9/23/2017 6:11	1	14.95		0.45		U	1.53	6247.0	3.98
69	9/23/2017 8:15	1	15.47				W	0.93	3202.2	
70	9/23/2017 8:32	1	15.66		0.46		C	3.24	6383.7	
71	9/23/2017 8:48	1	16.13				C	3.30	3137.6	
72	9/23/2017 9:05	1	17.06	18.98	0.48		W	1.63	4644.9	
73	9/23/2017 9:21	1	17.44				UW	2.69	7626.9	11.76
74	9/23/2017 9:38	1	17.34				U	3.52	9813.2	13.73
75	9/23/2017 9:54	1	18.34				UW	2.34	4125.8	
76	9/23/2017 10:11	1	17.92		0.45		U	2.39	8264.2	9.89
77	9/23/2017 12:15	1	20.41				W	2.16	2960.4	
78	9/23/2017 12:32	1	19.05		0.45		C	2.36	5163.5	
79	9/23/2017 12:48	1	17.92				C	3.19	3855.3	
80	9/23/2017 13:05	1	16.80	20.59	0.48		W	2.64	3817.9	
81	9/23/2017 13:21	1	15.96				UW	2.43	3815.7	8.44
82	9/23/2017 13:38	1	14.68				U	4.79	9517.4	3.65
83	9/23/2017 13:55	1	15.07				UW	0.08		
84	9/23/2017 14:11	1	15.27		0.49		U	0.12	747.8	0.77

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
85	9/23/2017 16:15	1		17.28							W		987.3	
86	9/23/2017 16:32	1		17.35				0.52			C		124.8	
87	9/23/2017 16:48	1		17.53							C	0.04	145.7	
88	9/23/2017 17:05	1		17.71	19.12			0.50			W		112.0	
89	9/23/2017 17:21	1		17.63							UW	0.15	17.8	1.20
90	9/23/2017 17:38	1		17.48							U	2.68	2136.0	0.92
91	9/23/2017 17:54	1		17.67							UW	0.03	87.9	
92	9/23/2017 18:11	1		17.59				0.49			U		393.3	
93	9/23/2017 20:15	1		14.18							W	0.11	429.5	
94	9/23/2017 20:32	1		14.00				0.49			C	0.54	1020.7	
95	9/23/2017 20:48	1		13.82							C	0.07	116.9	
96	9/23/2017 21:05	1		13.81	17.09			0.50			W	0.15	254.6	
97	9/23/2017 21:21	1		13.76							UW	0.89	3556.2	0.09
98	9/23/2017 21:38	1		13.37							U	2.24	6153.3	0.73
99	9/23/2017 21:54	1		13.52							UW		61.7	
100	9/23/2017 22:11	1		13.63				0.47			U	0.06	357.2	
101	9/24/2017 0:15	1		13.84							W	0.46	688.2	
102	9/24/2017 0:32	1		13.67				0.48			C	1.21	1930.1	
103	9/24/2017 0:48	1		13.67							C	0.41	685.1	
104	9/24/2017 1:05	1		13.88	16.26			0.49			W	0.38	521.0	
105	9/24/2017 1:21	1		13.87							UW	1.98	1935.4	
106	9/24/2017 1:38	1		14.31							U	3.50	4752.2	0.81
107	9/24/2017 1:54	1		14.37							UW		225.5	59.68
108	9/24/2017 2:11	1		14.39				0.46			U	0.26	963.3	
109	9/24/2017 4:15	1		15.16							W	0.44	923.8	0.23
110	9/24/2017 4:32	1		15.17				0.48			C	2.40	2513.9	
111	9/24/2017 4:48	1		15.16							C	0.77	961.3	
112	9/24/2017 5:05	1		15.30	16.71			0.49			W	0.32	606.4	
113	9/24/2017 5:21	1		15.32							UW	2.03	2354.2	0.01
114	9/24/2017 5:38	1		16.20							U	3.64	4079.1	1.65
115	9/24/2017 5:54	1		16.14							UW	0.41	474.9	
116	9/24/2017 6:11	1		16.47				0.46			U	1.97	3038.9	
117	9/24/2017 8:15	1		18.03							W	0.39	1040.1	0.77
118	9/24/2017 8:32	1		18.06				0.48			C	2.57	2767.0	
119	9/24/2017 8:48	1		18.40							C	0.87	1279.2	
120	9/24/2017 9:05	1		18.86	18.99			0.49			W	1.31	922.5	
121	9/24/2017 9:21	1		19.42							UW	2.26	2674.6	0.83
122	9/24/2017 9:38	1		20.73							U	2.47	3362.9	2.38
123	9/24/2017 9:54	1		20.57							UW	1.35	1025.1	
124	9/24/2017 10:11	1		20.40				0.46			U	1.84	2429.5	0.52
125	9/24/2017 12:15	1		22.37							W	0.77	1394.4	
126	9/24/2017 12:32	1		22.83				0.47			C	2.83	4365.0	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
127	9/24/2017 12:48	1	23.89				C	1.64	1776.7	
128	9/24/2017 13:05	1	24.68	23.38	0.49		W	2.50	1190.7	
129	9/24/2017 13:21	1	25.19				UW	2.44	2893.0	11.02
130	9/24/2017 13:38	1	23.84				U	4.08	5321.2	3.50
131	9/24/2017 13:54	1	23.69				UW	2.90	1559.3	
132	9/24/2017 14:11	1	22.20		0.45		U	2.33	2377.9	1.16
133	9/24/2017 16:15	1	18.90				W	0.13	834.6	
134	9/24/2017 16:32	1	18.27		0.49		C	0.76	1419.4	
135	9/24/2017 16:48	1	18.09				C	0.28	828.7	
136	9/24/2017 17:05	1	16.79	20.96	0.50		W	0.13	498.7	
137	9/24/2017 17:21	1	16.30				UW	2.47	1513.3	0.01
138	9/24/2017 17:38	1	16.04				U	2.63	3336.0	1.01
139	9/24/2017 17:54	1	16.20				UW	0.83	627.5	
140	9/24/2017 18:11	1	15.80		0.47		U	0.46	834.9	0.08
141	9/24/2017 20:15	1	14.12				W	0.23	781.2	
142	9/24/2017 20:32	1	13.87		0.48		C	0.61	1742.4	
143	9/24/2017 20:48	1	13.73				C	0.28	856.1	
144	9/24/2017 21:05	1	13.71	16.99	0.49		W	0.34	505.2	
145	9/24/2017 21:21	1	13.48				UW	2.37	1362.8	
146	9/24/2017 21:38	1	13.01				U	3.44	3286.5	0.24
147	9/24/2017 21:54	1	13.38				UW	1.57	816.6	7.37
148	9/24/2017 22:11	1	13.27		0.46		U	0.48	1546.0	
149	9/25/2017 0:15	1	12.48				W	0.28	862.4	0.40
150	9/25/2017 0:32	1	12.22		0.47		C	0.61	1384.0	
151	9/25/2017 0:48	1	12.07				C	0.25	911.2	
152	9/25/2017 1:05	1	11.96	15.31	0.49		W	0.31	695.0	
153	9/25/2017 1:21	1	11.73				UW	4.25	1700.1	
154	9/25/2017 1:38	1	11.38				U	2.16	2629.0	0.40
155	9/25/2017 1:54	1	11.77				UW	1.75	753.0	3.75
156	9/25/2017 2:11	1	11.71		0.46		U	0.99	1972.9	
157	9/25/2017 4:15	1	11.10				W	0.19	411.7	0.37
158	9/25/2017 4:32	1	10.98		0.49		C	0.32	694.7	
159	9/25/2017 4:48	1	11.00				C		321.7	
160	9/25/2017 5:05	1	11.13	14.23	0.50		W	0.12	296.2	
161	9/25/2017 5:21	1	10.87				UW	0.41	449.8	
162	9/25/2017 5:38	1	10.43				U	3.61	3302.4	0.20
163	9/25/2017 5:54	1	10.87				UW	0.33	242.4	0.28
164	9/25/2017 6:11	1	10.76		0.49		U	0.91	263.8	
165	9/25/2017 8:15	1	10.52				W	0.25	456.2	0.11
166	9/25/2017 8:32	1	10.33		0.50		C	0.21	834.8	
167	9/25/2017 8:48	1	10.56				C	0.17	503.8	
168	9/25/2017 9:05	1	10.91	13.76	0.50		W	0.03	370.1	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
169	9/25/2017 9:21	1	10.77				UW	0.36	581.0	
170	9/25/2017 9:38	1	10.56				U	0.81	1661.7	0.12
171	9/25/2017 9:54	1	11.19				UW	0.33	425.0	0.30
172	9/25/2017 10:11	1	11.17		0.47		U	0.49	929.6	
173	9/25/2017 12:15	1	13.40				W	0.30	804.2	0.13
174	9/25/2017 12:32	1	13.90		0.48		C	0.47	877.3	
175	9/25/2017 12:48	1	13.81				C	0.25	881.4	
176	9/25/2017 13:05	1	13.55	16.29	0.50		W	0.30	547.3	
177	9/25/2017 13:21	1	13.53				UW	1.21	949.3	
178	9/25/2017 13:38	1	13.48				U	2.00	2330.9	0.22
179	9/25/2017 13:54	1	14.97				UW	0.84	825.0	1.24
180	9/25/2017 14:11	1	14.89		0.46		U	0.36	787.4	
181	9/25/2017 16:15	1	12.77				W	0.29	819.5	0.58
182	9/25/2017 16:32	1	12.29		0.47		C	0.76	2941.6	
183	9/25/2017 16:48	1	12.16				C	0.23	846.6	
184	9/25/2017 17:05	1	12.35	15.40	0.50		W	0.30	421.4	
185	9/25/2017 17:21	1	12.02				UW	1.40	484.3	
186	9/25/2017 17:38	1	11.60				U	1.97	1616.9	0.12
187	9/25/2017 17:54	1	11.86				UW	0.46	365.2	0.38
188	9/25/2017 18:11	1	11.69		0.47		U	0.92	936.9	
189	9/25/2017 20:15	1	10.88				W	0.07	371.9	0.10
190	9/25/2017 20:32	1	10.77		0.49		C	0.22	809.7	
191	9/25/2017 20:48	1	10.75				C	0.15	644.0	
192	9/25/2017 21:05	1	10.97	13.77	0.50		W	0.24	493.6	
193	9/25/2017 21:22	1	10.75				UW	0.81	558.5	
194	9/25/2017 21:38	1	10.57				U	1.07	1074.3	0.06
195	9/25/2017 21:55	1	10.87				UW	0.31	72.8	0.11
196	9/25/2017 22:11	1	10.84		0.49		U	0.39		
197	9/26/2017 0:15	1	10.58				W	0.13	327.2	0.04
198	9/26/2017 0:32	1	10.37		0.50		C	0.39	898.7	
199	9/26/2017 0:48	1	10.35				C		395.7	
200	9/26/2017 1:05	1	10.44	13.10	0.50		W	0.24	440.5	
201	9/26/2017 1:21	1	10.26				UW	0.13	175.7	
202	9/26/2017 1:38	1	9.91				U	1.35	1515.4	0.03
203	9/26/2017 1:55	1	10.23				UW	0.18	264.9	0.05
204	9/26/2017 2:11	1	10.17		0.48		U	2.32	2619.8	
205	9/26/2017 4:15	1	10.11				W	0.17	403.3	0.03
206	9/26/2017 4:32	1	9.98		0.49		C	0.52	906.4	
207	9/26/2017 4:48	1	9.93				C	0.15	431.9	
208	9/26/2017 5:05	1	10.12	12.62	0.50		W	0.25	423.7	
209	9/26/2017 5:21	1	10.09				UW	0.55	708.9	
210	9/26/2017 5:38	1	9.85				U	1.77	1801.8	0.03

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
211	9/26/2017 5:55	1		10.19							UW	0.42	400.4	0.04
212	9/26/2017 6:11	1		10.16				0.47			U	3.13	3082.6	
213	9/26/2017 8:15	1		10.23							W	0.17	517.0	0.03
214	9/26/2017 8:32	1		10.30				0.48			C	0.35	1007.4	
215	9/26/2017 8:48	1		10.69							C	0.17	625.4	
216	9/26/2017 9:05	1		11.39	13.25			0.50			W	0.33	481.2	
217	9/26/2017 9:21	1		11.57							UW	0.50	852.3	
218	9/26/2017 9:38	1		11.14							U	1.76	1896.3	0.07
219	9/26/2017 9:54	1		11.76							UW	0.55	512.6	0.19
220	9/26/2017 10:11	1		11.69				0.47			U	1.63	2446.7	0.01
221	9/26/2017 12:15	1		13.38							W	0.13	638.5	0.12
222	9/26/2017 12:32	1		13.46				0.48			C	0.50	1402.8	
223	9/26/2017 12:48	1		13.70							C	0.23	900.5	
224	9/26/2017 13:05	1		14.15	16.15			0.50			W	0.16	701.5	
225	9/26/2017 13:21	1		14.49							UW	1.51	1157.6	
226	9/26/2017 13:38	1		13.24							U	1.50	2084.1	0.27
227	9/26/2017 13:54	1		14.28							UW	1.41	702.6	0.76
228	9/26/2017 14:11	1		14.61				0.46			U	1.83	4174.4	
229	9/26/2017 16:15	1		19.24							W		587.5	0.39
230	9/26/2017 16:32	1		19.41				0.46			C	0.61	2056.1	
231	9/26/2017 16:48	1		19.06							C	0.23	1256.6	
232	9/26/2017 17:05	1		17.89	18.54			0.49			W	0.20	725.0	
233	9/26/2017 17:21	1		18.61							UW	2.70	2204.0	0.56
234	9/26/2017 17:38	1		16.13							U	1.99	2100.6	0.14
235	9/26/2017 17:54	1		17.20							UW	2.52	988.5	
236	9/26/2017 18:11	1		17.05				0.44			U	1.99	2937.1	0.05
237	9/26/2017 20:15	1		9.00							W	0.03	538.5	
238	9/26/2017 20:32	1		8.34				0.45			C	0.71	1686.0	
239	9/26/2017 20:48	1		8.43							C	0.30	1168.5	
240	9/26/2017 21:05	1		8.19	13.15			0.47			W	0.21	512.1	
241	9/26/2017 21:21	1		7.91							UW	0.82	924.5	0.14
242	9/26/2017 21:38	1		7.19							U	2.08	1646.0	0.11
243	9/26/2017 21:54	1		7.69							UW	0.65	703.1	
244	9/26/2017 22:11	1		7.28				0.43			U	1.65	1527.2	
245	9/27/2017 0:15	1		6.13							W	0.11	524.6	0.01
246	9/27/2017 0:32	1		5.84				0.45			C	0.94	2083.5	
247	9/27/2017 0:48	1		5.77							C	0.17	1149.7	
248	9/27/2017 1:08	1		6.23	10.40			0.48			W	0.28	529.4	
249	9/27/2017 1:24	1		5.85							UW	0.92	775.4	
250	9/27/2017 1:41	1		5.97							U	3.60	1839.5	0.02
251	9/27/2017 1:57	1		6.69							UW	0.51	503.9	0.20
252	9/27/2017 2:14	1		6.45				0.43			U	3.39	2683.9	0.01

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
253	9/27/2017 4:15	1		5.45							W	0.29	1156.7	0.04
254	9/27/2017 4:32	1		4.96				0.45			C	1.87	2187.9	
255	9/27/2017 4:48	1		4.82							C	0.30	850.9	
256	9/27/2017 5:08	1		5.10		9.16		0.48			W	0.32	614.9	
257	9/27/2017 5:24	1		4.49							UW	1.56	778.8	
258	9/27/2017 5:41	1		3.16							U	2.18	1914.7	0.02
259	9/27/2017 5:57	1		4.41							UW	0.54	504.1	0.30
260	9/27/2017 6:14	1		4.08				0.43			U	2.53	2782.0	
261	9/27/2017 8:15	1		6.44							W	0.29	585.7	0.07
262	9/27/2017 8:32	1		6.98				0.45			C	0.80	1996.1	0.05
263	9/27/2017 8:48	1		6.40							C	0.33	721.9	0.03
264	9/27/2017 9:05	1		8.98		10.18		0.48			W	0.34	510.4	0.04
265	9/27/2017 9:21	1		9.57							UW	1.15	946.3	0.04
266	9/27/2017 9:38	1		11.26							U	1.80	2145.1	0.90
267	9/27/2017 9:54	1		11.40							UW	0.39	546.4	0.08
268	9/27/2017 10:11	1		9.62				0.43			U	3.77	5308.6	
269	9/27/2017 12:15	1		19.81							W	0.48	1170.4	
270	9/27/2017 12:32	1		20.55				0.45			C	2.44	5358.5	
271	9/27/2017 12:48	1		22.34							C	0.38	1850.1	
272	9/27/2017 13:05	1		22.46		21.45		0.47			W	0.48	926.1	
273	9/27/2017 13:21	1		22.56							UW	2.11	2337.5	3.44
274	9/27/2017 13:38	1		19.25							U	4.00	4882.3	0.84
275	9/27/2017 13:54	1		22.14							UW	1.73	1103.4	
276	9/27/2017 14:11	1		22.06				0.43			U	3.97	4387.1	0.54
277	9/27/2017 16:15	1		23.68							W	2.99	7640.2	
278	9/27/2017 16:32	1		22.38				0.43			C	2.39	4490.5	
279	9/27/2017 16:48	1		23.05							C	3.91	8939.5	
280	9/27/2017 17:05	1		21.77		20.82		0.46			W	5.12	7182.2	
281	9/27/2017 17:21	1		22.55							UW	4.42	4662.2	1.32
282	9/27/2017 17:38	1		20.60							U	4.40	4814.5	
283	9/27/2017 17:54	1		21.22							UW	2.93	2766.5	
284	9/27/2017 18:11	1		20.87				0.41			U	3.69	4524.6	0.29
285	9/27/2017 20:15	1		10.50							W	3.24	4712.1	
286	9/27/2017 20:32	1		10.05				0.42			C	1.89	3654.8	
287	9/27/2017 20:48	1		9.99							C	2.10	5099.1	
288	9/27/2017 21:05	1		9.61		14.67		0.46			W	2.75	3760.5	
289	9/27/2017 21:21	1		9.42							UW	3.04	3027.5	0.07
290	9/27/2017 21:38	1		9.12							U	3.33	3031.7	0.36
291	9/27/2017 21:54	1		9.31							UW	1.51	1803.5	
292	9/27/2017 22:11	1		8.44				0.40			U	3.36	3835.0	
293	9/28/2017 0:15	1		7.08							W	2.94	4182.0	0.17
294	9/28/2017 0:32	1		6.84				0.41			C	2.50	3525.4	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
295	9/28/2017 0:48	1		6.59							C	2.14	3778.4	
296	9/28/2017 1:05	1		6.99	11.52	0.45					W	2.97	3093.9	
297	9/28/2017 1:21	1		6.58							UW	3.52	2380.9	
298	9/28/2017 1:38	1		5.76							U	3.17	2856.2	0.28
299	9/28/2017 1:54	1		6.66							UW	1.56	1425.8	
300	9/28/2017 2:11	1		6.08		0.40					U	3.28	3236.3	
301	9/28/2017 4:15	1		5.55							W	2.36	3863.5	0.11
302	9/28/2017 4:32	1		5.40		0.41					C	1.45	3075.8	
303	9/28/2017 4:48	1		5.35							C	1.85	3353.7	
304	9/28/2017 5:05	1		5.65	9.77	0.45					W	2.95	2522.3	
305	9/28/2017 5:21	1		5.21							UW	2.49	2071.4	
306	9/28/2017 5:38	1		4.54							U	2.64	2644.2	0.18
307	9/28/2017 5:54	1		5.52							UW	1.43	1281.3	0.97
308	9/28/2017 6:11	1		5.09		0.40					U	2.77	3153.3	
309	9/28/2017 8:15	1		7.16							W	2.73	4352.0	0.14
310	9/28/2017 8:32	1		8.09		0.41					C	2.35	3091.7	0.02
311	9/28/2017 8:48	1		7.89							C	1.85	3202.1	0.04
312	9/28/2017 9:05	1		10.32	11.16	0.46					W	3.31	2604.9	0.06
313	9/28/2017 9:21	1		11.27							UW	1.72	2318.2	0.45
314	9/28/2017 9:38	1		13.33							U	2.72	2849.6	0.23
315	9/28/2017 9:54	1		13.01							UW	1.91	1417.9	
316	9/28/2017 10:11	1		11.75		0.40					U	3.41	3565.4	0.01
317	9/28/2017 12:15	1		22.98							W	3.10	4166.4	
318	9/28/2017 12:32	1		24.23		0.41					C	2.14	5192.0	
319	9/28/2017 12:48	1		24.92							C	2.69	5804.3	
320	9/28/2017 13:05	1		24.59	21.68	0.45					W	3.57	5458.4	
321	9/28/2017 13:21	1		24.64							UW	3.01	4976.9	3.14
322	9/28/2017 13:38	1		24.26							U	3.03	4469.8	
323	9/28/2017 13:54	1		25.46							UW	4.60	4376.7	
324	9/28/2017 14:11	1		26.82		0.40					U	3.94	5005.4	0.98
325	9/28/2017 16:15	1		25.71							W	3.59	6103.2	
326	9/28/2017 16:32	1		24.36		0.40					C	3.37	4525.5	
327	9/28/2017 16:48	1		24.74							C	2.59	4588.5	
328	9/28/2017 17:05	1		23.76	21.70	0.44					W	2.65	4804.2	
329	9/28/2017 17:21	1		24.04							UW	4.32	4943.0	3.28
330	9/28/2017 17:38	1		23.11							U	3.29	3568.7	
331	9/28/2017 17:54	1		22.38							UW	3.04	4846.3	
332	9/28/2017 18:11	1		22.21		0.39					U	3.83	3477.3	0.83
333	9/28/2017 20:15	1		11.62							W	3.45	4390.1	
334	9/28/2017 20:32	1		11.43		0.39					C	3.04	4139.9	
335	9/28/2017 20:48	1		11.79							C	2.03	4599.8	
336	9/28/2017 21:05	1		12.42	15.98	0.43					W	3.39	3341.7	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
337	9/28/2017 21:21	1	11.49				UW	3.08	3350.8	
338	9/28/2017 21:38	1	11.48				U	2.73	2899.3	0.19
339	9/28/2017 21:54	1	11.10				UW	2.76	3024.8	
340	9/28/2017 22:11	1	11.75		0.38		U	4.13	3827.1	
341	9/29/2017 0:15	1	11.51				W	2.68	5084.5	0.07
342	9/29/2017 0:32	1	11.13		0.39		C	2.34	3201.3	
343	9/29/2017 0:48	1	10.81				C	2.24	4298.7	
344	9/29/2017 1:05	1	10.61	13.24	0.43		W	3.63	4382.6	
345	9/29/2017 1:22	1	10.03				UW	2.98	3059.1	
346	9/29/2017 1:38	1	10.37				U	2.32	2825.7	0.03
347	9/29/2017 1:55	1	9.87				UW	3.56	2826.0	0.14
348	9/29/2017 2:11	1	9.54		0.37		U	3.88	3609.0	
349	9/29/2017 4:15	1	7.60				W	2.45	4561.1	0.02
350	9/29/2017 4:32	1	7.59		0.38		C	2.28	3191.4	
351	9/29/2017 4:48	1	7.22				C	2.66	3747.2	
352	9/29/2017 5:05	1	6.58	10.99	0.43		W	3.11	2667.6	
353	9/29/2017 5:21	1	5.95				UW	2.27	2409.1	
354	9/29/2017 5:38	1	5.95				U	2.13	2306.1	0.05
355	9/29/2017 5:55	1	6.12				UW	2.63	2227.2	0.05
356	9/29/2017 6:11	1	6.40		0.37		U	3.11	3151.6	
357	9/29/2017 8:15	1	7.32				W	3.16	3968.0	0.04
358	9/29/2017 8:32	1	7.95		0.38		C	1.40	3108.8	0.03
359	9/29/2017 8:48	1	7.58				C	1.73	3353.8	0.03
360	9/29/2017 9:05	1	9.77	11.29	0.43		W	2.85	2782.6	0.03
361	9/29/2017 9:21	1	10.31				UW	2.66	2525.5	0.08
362	9/29/2017 9:38	1	12.33				U	1.98	2812.3	0.60
363	9/29/2017 9:54	1	12.10				UW	2.16	2574.6	0.25
364	9/29/2017 10:11	1	10.07		0.37		U	2.82	3077.3	
365	9/29/2017 12:15	1	20.43				W	3.14	5526.8	8.43
366	9/29/2017 12:32	1	21.70		0.39		C	2.24	4748.5	
367	9/29/2017 12:48	1	22.75				C	3.03	5268.0	
368	9/29/2017 13:05	1	22.87	21.76	0.43		W	3.76	5678.6	
369	9/29/2017 13:21	1	22.78				UW	3.24	4909.9	1.21
370	9/29/2017 13:38	1	21.01				U	2.71	3805.8	
371	9/29/2017 13:54	1	23.23				UW	3.05	4074.0	
372	9/29/2017 14:11	1	24.23		0.39		U	3.97	4947.5	0.23
373	9/29/2017 16:15	1	23.82				W	0.32	1243.0	
374	9/29/2017 16:32	1	23.65		0.38		C	3.23	4942.3	
375	9/29/2017 16:48	1	24.08				C	3.15	5508.2	
376	9/29/2017 17:05	1	22.01	23.22	0.43		W	0.26	939.0	
377	9/29/2017 17:21	1	22.42				UW	2.49	1745.3	1.20
378	9/29/2017 17:38	1	19.80				U	3.88	3756.2	0.06

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
379	9/29/2017 17:54	1	20.55				UW	2.79	3965.0	
380	9/29/2017 18:11	1	20.12		0.38		U	2.65	1572.1	0.28
381	9/29/2017 20:15	1	10.23				W	0.66	1332.6	
382	9/29/2017 20:32	1	9.46		0.37		C	2.52	4156.3	
383	9/29/2017 20:48	1	9.25				C	2.20	3941.0	
384	9/29/2017 21:05	1	9.80	15.00	0.42		W	0.28	688.0	
385	9/29/2017 21:21	1	9.39				UW	2.41	1378.5	
386	9/29/2017 21:38	1	10.00				U	2.90	2799.8	0.08
387	9/29/2017 21:54	1	9.28				UW	2.49	2891.6	1.61
388	9/29/2017 22:11	1	8.97		0.37		U	2.64	1296.9	
389	9/30/2017 0:15	1	9.15				W	0.69	1963.4	0.04
390	9/30/2017 0:32	1	9.18		0.36		C	2.36	4184.3	
391	9/30/2017 0:48	1	9.29				C	2.73	4378.1	
392	9/30/2017 1:05	1	9.17	12.28	0.41		W	0.78	893.6	
393	9/30/2017 1:21	1	9.00				UW	2.25	1328.4	
394	9/30/2017 1:38	1	9.23				U	1.86	2424.2	0.02
395	9/30/2017 1:55	1	8.91				UW	2.88	3592.0	0.06
396	9/30/2017 2:11	1	8.83		0.37		U	2.71	1564.9	
397	9/30/2017 4:15	1	9.39				W	0.82	1860.7	0.04
398	9/30/2017 4:32	1	9.78		0.36		C	2.47	4684.6	0.02
399	9/30/2017 4:48	1	9.99				C	3.67	5695.6	
400	9/30/2017 5:05	1	10.04	11.92	0.41		W	2.21	1394.0	
401	9/30/2017 5:21	1	10.07				UW	0.71	1331.4	
402	9/30/2017 5:38	1	10.74				U	2.54	2281.0	0.05
403	9/30/2017 5:54	1	10.45				UW	2.75	3730.8	0.09
404	9/30/2017 6:11	1	10.53		0.37		U	2.99	2033.2	0.01
405	9/30/2017 8:15	1	9.81				W	0.88	1714.8	0.11
406	9/30/2017 8:32	1	10.04		0.36		C	3.17	4556.9	
407	9/30/2017 8:48	1	10.35				C	5.76	7756.4	
408	9/30/2017 9:05	1	10.76	12.61	0.41		W	1.30	823.4	
409	9/30/2017 9:21	1	11.29				UW	0.69	1398.2	0.01
410	9/30/2017 9:38	1	12.91				U	2.48	2475.9	0.14
411	9/30/2017 9:54	1	12.91				UW	3.70	3609.0	0.17
412	9/30/2017 10:11	1	12.93		0.37		U	1.77	1813.1	0.03
413	9/30/2017 12:15	1	15.34				W	1.70	3438.4	0.12
414	9/30/2017 12:32	1	16.04		0.37		C	3.50	5982.9	
415	9/30/2017 12:48	1	16.48				C	4.98	8401.9	
416	9/30/2017 13:05	1	16.86	16.25	0.42		W	2.25	2320.5	
417	9/30/2017 13:21	1	17.91				UW	1.78	2057.5	0.45
418	9/30/2017 13:38	1	18.30				U	2.42	2771.2	
419	9/30/2017 13:54	1	17.95				UW	4.62	6478.9	
420	9/30/2017 14:11	1	17.15		0.47		U	2.51	3344.3	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
421	9/30/2017 16:15	1	17.60				W	3.29	3816.5	0.20
422	9/30/2017 16:32	1	17.15		0.37		C	3.41	5637.5	
423	9/30/2017 16:48	1	17.12				C	3.73	6131.3	
424	9/30/2017 17:05	1	17.02	17.10	0.42		W	5.25	3363.1	
425	9/30/2017 17:21	1	15.74				UW	3.19	2318.4	0.01
426	9/30/2017 17:38	1	15.95				U	2.46	2585.1	0.04
427	9/30/2017 17:54	1	14.93				UW	3.81	5245.6	
428	9/30/2017 18:11	1	14.58		0.48		U	1.64	1289.7	
429	9/30/2017 20:15	1	14.29				W	0.90	2080.4	0.03
430	9/30/2017 20:32	1	14.38		0.38		C	3.49	5469.5	
431	9/30/2017 20:48	1	14.59				C	3.56	5790.5	
432	9/30/2017 21:05	1	14.47	15.26	0.42		W	0.76	881.0	
433	9/30/2017 21:21	1	14.31				UW	0.38	646.5	
434	9/30/2017 21:38	1	15.28				U	2.39	2024.4	0.07
435	9/30/2017 21:55	1	14.36				UW	3.32	4637.1	0.02
436	9/30/2017 22:11	1	14.37		0.48		U	2.11	1119.6	
437	10/1/2017 0:15	1	14.30				W	0.77	1686.7	0.03
438	10/1/2017 0:32	1	14.30		0.38		C	3.64	6554.0	
439	10/1/2017 0:49	1	14.54				C	4.04	7632.1	
440	10/1/2017 1:05	1	14.47	14.43	0.42		W	2.38	1915.2	
441	10/1/2017 1:22	1	14.51				UW	1.32	1684.7	0.01
442	10/1/2017 1:38	1	15.59				U	1.47	2119.0	0.19
443	10/1/2017 1:55	1	14.19				UW	4.82	6165.7	
444	10/1/2017 2:11	1	14.07		0.48		U	3.16	2918.4	
445	10/1/2017 4:15	1	12.55				W		312.7	0.04
446	10/1/2017 4:32	1	12.31		0.48		C	0.39	591.9	
447	10/1/2017 4:48	1	12.30				C	0.02	304.8	
448	10/1/2017 5:05	1	12.25	14.17	0.49		W		347.8	
449	10/1/2017 5:22	1	12.21				UW	0.28	226.1	
450	10/1/2017 5:38	1	12.46				U	0.16	93.4	
451	10/1/2017 5:55	1	12.34				UW	0.05	86.5	
452	10/1/2017 6:11	1	12.38		0.50		U	0.47	159.4	
453	10/1/2017 8:15	1	12.74				W		185.4	0.03
454	10/1/2017 8:32	1	12.54		0.49		C	0.28	547.2	
455	10/1/2017 8:48	1	12.40				C	0.20	468.7	
456	10/1/2017 9:05	1	12.34	14.15	0.49		W	0.04	144.0	
457	10/1/2017 9:21	1	12.56				UW	0.33	655.0	
458	10/1/2017 9:38	1	12.63				U	0.27	406.5	
459	10/1/2017 9:54	1	12.80				UW	0.11	219.4	
460	10/1/2017 10:11	1	13.14		0.50		U	0.65	628.2	
461	10/1/2017 12:15	1	16.24				W	0.68	1480.9	0.02
462	10/1/2017 12:32	1	15.56		0.47		C	2.85	1767.5	0.01

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
463	10/1/2017 12:48	1	15.96				C	3.16	2868.6	
464	10/1/2017 13:05	1	17.55	16.97	0.49		W	0.07	474.8	0.04
465	10/1/2017 13:21	1	18.16				UW	2.21	919.6	0.01
466	10/1/2017 13:38	1	19.04				U	1.35	1122.1	0.14
467	10/1/2017 13:54	1	20.02				UW	0.03	386.4	0.10
468	10/1/2017 14:11	1	19.89		0.49		U	5.03	3022.8	
469	10/1/2017 16:15	1	22.72				W	1.38	1889.0	0.08
470	10/1/2017 16:32	1	21.34		0.46		C	2.51	2983.6	
471	10/1/2017 16:48	1	22.12				C	2.86	3721.7	
472	10/1/2017 17:05	1	21.86	20.08	0.48		W	0.40	715.4	
473	10/1/2017 17:21	1	20.10				UW	2.06	1285.1	0.02
474	10/1/2017 17:38	1	21.29				U	3.23	1881.6	0.09
475	10/1/2017 17:54	1	20.98				UW	0.86	529.6	
476	10/1/2017 18:11	1	20.33		0.49		U	4.89	1842.6	
477	10/1/2017 20:15	1	15.79				W	0.86	1662.4	
478	10/1/2017 20:32	1	15.50		0.45		C	2.22	1842.2	
479	10/1/2017 20:48	1	15.46				C	2.83	3939.5	
480	10/1/2017 21:05	1	15.28	16.30	0.48		W	0.30	586.6	
481	10/1/2017 21:21	1	15.38				UW	3.17	1146.9	
482	10/1/2017 21:38	1	16.69				U	2.50	1103.0	0.02
483	10/1/2017 21:54	1	15.64				UW	0.69	450.2	0.10
484	10/1/2017 22:11	1	15.70		0.49		U	7.18	5502.3	
485	10/2/2017 0:15	1	14.53				W	0.11	139.9	0.01
486	10/2/2017 0:32	1	14.38		0.51		C	0.74	493.2	
487	10/2/2017 0:49	1	14.36				C		87.6	
488	10/2/2017 1:05	1	14.34	15.91	0.50		W		142.1	
489	10/2/2017 1:22	1	14.24				UW	0.82	596.2	
490	10/2/2017 1:38	1	14.21				U	0.03	2.7	
491	10/2/2017 1:55	1	14.28				UW	0.10	160.5	
492	10/2/2017 2:11	1	14.23		0.50		U	0.44		
493	10/2/2017 4:15	1	14.15				W	0.22	458.9	
494	10/2/2017 4:32	1	13.71		0.50		C	0.85	967.9	
495	10/2/2017 4:48	1	13.55				C	0.01	400.1	
496	10/2/2017 5:05	1	13.65	15.31	0.49		W	0.05	291.7	
497	10/2/2017 5:22	1	13.59				UW	2.60	801.8	
498	10/2/2017 5:38	1	13.72				U	1.26	612.4	
499	10/2/2017 5:55	1	13.70				UW	0.07	209.6	
500	10/2/2017 6:11	1	13.64		0.51		U	0.43	513.6	
501	10/2/2017 8:15	1	13.57				W	0.04	627.2	
502	10/2/2017 8:32	1	13.46		0.49		C	1.00	1104.4	
503	10/2/2017 8:48	1	13.44				C	1.29	799.1	
504	10/2/2017 9:05	1	13.52	15.35	0.49		W	0.05	373.9	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
505	10/2/2017 9:21	1	13.60				UW	9.37	1324.4	
506	10/2/2017 9:38	1	13.60				U	2.31	808.7	
507	10/2/2017 9:54	1	13.88				UW	0.53	356.1	0.02
508	10/2/2017 10:11	1	14.22		0.50		U	0.92	434.3	
509	10/2/2017 12:15	1	16.38				W	0.45	960.6	0.01
510	10/2/2017 12:32	1	16.21		0.48		C	2.58	1298.9	0.01
511	10/2/2017 12:48	1	17.06				C	0.73	759.9	
512	10/2/2017 13:05	1	17.93	18.78	0.49		W	0.48	629.2	
513	10/2/2017 13:21	1	19.46				UW	9.48	2085.7	0.01
514	10/2/2017 13:38	1	17.55				U	3.27	1487.4	0.12
515	10/2/2017 13:54	1	18.87				UW	1.88	566.3	0.43
516	10/2/2017 14:11	1	18.37		0.50		U	3.01	692.7	
517	10/2/2017 16:15	1	16.74				W	0.94	1091.0	0.01
518	10/2/2017 16:32	1	16.40		0.48		C	7.93	3861.9	
519	10/2/2017 16:48	1	16.25				C	0.66	858.2	
520	10/2/2017 17:05	1	16.03	17.87	0.49		W	0.36	655.0	
521	10/2/2017 17:21	1	15.38				UW	5.43	2056.0	
522	10/2/2017 17:38	1	14.97				U	3.21	931.1	0.03
523	10/2/2017 17:54	1	14.82				UW	1.94	472.7	0.04
524	10/2/2017 18:11	1	14.78		0.49		U	2.41	586.7	
525	10/2/2017 20:15	1	13.79				W	3.23	1791.5	0.01
526	10/2/2017 20:32	1	13.66		0.48		C	2.19	1775.7	
527	10/2/2017 20:48	1	13.58				C	0.97	868.4	
528	10/2/2017 21:05	1	13.55	15.68	0.49		W	0.61	680.6	
529	10/2/2017 21:21	1	13.33				UW	8.33	3959.1	
530	10/2/2017 21:38	1	13.15				U	2.18	1221.6	
531	10/2/2017 21:54	1	13.10				UW	0.74	502.2	0.06
532	10/2/2017 22:11	1	13.06		0.49		U	1.93	516.3	
533	10/3/2017 0:15	1	12.14				W	0.08	226.7	0.02
534	10/3/2017 0:32	1	11.90		0.51		C	0.03	173.5	
535	10/3/2017 0:48	1	11.90				C		245.0	
536	10/3/2017 1:05	1	12.09	14.34	0.50		W	0.04	1166.4	
537	10/3/2017 1:22	1	11.91				UW	0.13	57.9	
538	10/3/2017 1:38	1	11.72				U	0.26	1117.9	
539	10/3/2017 1:55	1	11.84				UW		55.8	
540	10/3/2017 2:11	1	11.73		0.50		U	0.05	147.1	
541	10/3/2017 4:15	1	11.34				W		301.1	
542	10/3/2017 4:32	1	11.04		0.51		C	0.39	374.3	
543	10/3/2017 4:48	1	10.95				C		134.0	
544	10/3/2017 5:05	1	11.11	13.52	0.50		W	0.08	135.7	
545	10/3/2017 5:21	1	10.98				UW	0.17	293.3	
546	10/3/2017 5:38	1	10.66				U	0.25	514.5	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
547	10/3/2017 5:54	1		10.96							UW	0.05	413.1	
548	10/3/2017 6:11	1		10.96				0.51			U		525.8	
549	10/3/2017 8:15	1		10.35							W	0.77	1982.4	
550	10/3/2017 8:32	1		10.41				0.50			C	0.52	744.8	
551	10/3/2017 8:48	1		10.68							C	0.19	402.4	
552	10/3/2017 9:05	1		10.84	13.15			0.50			W	0.23	336.5	
553	10/3/2017 9:21	1		10.63							UW	6.96	1280.1	
554	10/3/2017 9:38	1		10.51							U	0.89	733.3	
555	10/3/2017 9:54	1		10.93							UW	0.10	70.7	
556	10/3/2017 10:11	1		11.28				0.51			U	0.22	226.3	
557	10/3/2017 12:15	1		17.01							W	1.43	1395.7	0.03
558	10/3/2017 12:32	1		16.68				0.49			C	0.73	1891.5	0.02
559	10/3/2017 12:48	1		17.78							C	0.05	711.0	
560	10/3/2017 13:05	1		16.76	18.17			0.49			W	0.15	452.1	
561	10/3/2017 13:21	1		16.98							UW	6.43	2207.0	
562	10/3/2017 13:38	1		17.27							U	1.81	1838.7	0.03
563	10/3/2017 13:54	1		19.38							UW	2.55	403.9	0.13
564	10/3/2017 14:11	1		20.70				0.51			U	2.84	589.6	0.02
565	10/3/2017 16:15	1		19.91							W	2.08	2493.3	0.06
566	10/3/2017 16:32	1		17.31				0.48			C	1.76	3107.5	
567	10/3/2017 16:48	1		20.01							C	2.89	2439.5	
568	10/3/2017 17:05	1		18.41	19.33			0.48			W	0.58	809.8	
569	10/3/2017 17:21	1		18.85							UW	5.94	1811.5	
570	10/3/2017 17:38	1		16.24							U	2.21	2043.9	0.17
571	10/3/2017 17:54	1		17.19							UW	1.59	468.1	0.40
572	10/3/2017 18:11	1		17.10				0.50			U	2.45	677.0	
573	10/3/2017 20:15	1		9.40							W	0.42	742.7	
574	10/3/2017 20:32	1		8.36				0.47			C	0.57	1065.6	
575	10/3/2017 20:48	1		8.15							C	0.54	955.6	
576	10/3/2017 21:05	1		9.02	13.08			0.48			W	0.36	637.7	
577	10/3/2017 21:21	1		8.85							UW	2.67	1086.7	
578	10/3/2017 21:38	1		9.08							U	1.46	1157.4	
579	10/3/2017 21:54	1		8.69							UW	0.51	501.8	0.03
580	10/3/2017 22:11	1		8.71				0.50			U	0.86	460.9	
581	10/4/2017 0:15	1		7.31							W	0.78	967.3	0.03
582	10/4/2017 0:32	1		7.15				0.47			C	1.33	1604.6	
583	10/4/2017 0:49	1		7.24							C	0.49	1187.7	
584	10/4/2017 1:05	1		7.46	10.48			0.48			W	1.81	849.1	
585	10/4/2017 1:22	1		7.12							UW	3.03	1626.5	
586	10/4/2017 1:38	1		6.78							U	1.40	1187.7	
587	10/4/2017 1:54	1		6.49							UW	0.41	409.9	
588	10/4/2017 2:11	1		6.13				0.49			U	0.53	531.1	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
589	10/4/2017 4:15	1		4.73							W	0.87	973.9	0.01
590	10/4/2017 4:32	1		4.40				0.46			C	0.92	2034.0	
591	10/4/2017 4:48	1		4.08							C	0.61	895.4	
592	10/4/2017 5:05	1		4.17		8.13		0.48			W	0.61	633.2	
593	10/4/2017 5:21	1		3.83							UW	2.47	1037.7	
594	10/4/2017 5:38	1		3.56							U	0.81	1010.7	
595	10/4/2017 5:54	1		3.68							UW	0.39	313.6	
596	10/4/2017 6:11	1		3.46				0.49			U	0.50	497.4	
597	10/4/2017 8:15	1		4.53							W	1.78	1827.1	0.01
598	10/4/2017 8:32	1		4.89				0.46			C	1.65	2616.3	0.01
599	10/4/2017 8:48	1		4.12							C	0.51	856.8	0.01
600	10/4/2017 9:05	1		6.15		8.33		0.48			W	0.70	1319.4	
601	10/4/2017 9:21	1		6.52							UW	3.24	1791.7	0.01
602	10/4/2017 9:38	1		8.27							U	0.76	1063.2	0.01
603	10/4/2017 9:55	1		8.08							UW	0.31	321.7	0.01
604	10/4/2017 10:11	1		6.24				0.49			U	0.51	513.7	0.02
605	10/4/2017 12:15	1		15.75							W	2.50	1472.5	0.05
606	10/4/2017 12:32	1		17.02				0.46			C	2.83	5229.9	0.01
607	10/4/2017 12:48	1		17.58							C	2.05	2463.9	
608	10/4/2017 13:05	1		17.34		18.42		0.47			W	2.97	2132.7	
609	10/4/2017 13:21	1		17.52							UW	2.61	1753.4	
610	10/4/2017 13:38	1		15.57							U	3.48	3400.9	0.13
611	10/4/2017 13:54	1		18.36							UW	1.93	1025.6	0.34
612	10/4/2017 14:11	1		19.11				0.49			U	2.19	1279.5	
613	10/4/2017 16:15	1		19.71							W	3.22	4035.2	0.17
614	10/4/2017 16:32	1		19.23				0.45			C	3.68	6504.7	
615	10/4/2017 16:48	1		19.27							C	2.73	6314.2	
616	10/4/2017 17:05	1		17.99		18.57		0.46			W	3.24	4177.3	
617	10/4/2017 17:21	1		18.34							UW	3.45	4193.2	
618	10/4/2017 17:38	1		16.90							U	2.54	3579.2	0.14
619	10/4/2017 17:54	1		17.38							UW	3.27	3024.6	0.20
620	10/4/2017 18:11	1		16.72				0.49			U	2.37	1984.0	
621	10/4/2017 20:15	1		9.37							W	2.38	3157.0	0.02
622	10/4/2017 20:32	1		9.92				0.44			C	2.53	2904.1	
623	10/4/2017 20:48	1		10.37							C	2.16	3511.7	
624	10/4/2017 21:05	1		10.64		13.54		0.46			W	3.62	3409.8	
625	10/4/2017 21:21	1		10.86							UW	2.10	2303.6	
626	10/4/2017 21:38	1		11.44							U	1.98	2625.0	
627	10/4/2017 21:54	1		11.29							UW	1.79	2285.1	0.03
628	10/4/2017 22:11	1		11.32				0.49			U	1.76	2037.4	
629	10/5/2017 0:15	1		11.81							W	2.62	3709.8	0.05
630	10/5/2017 0:32	1		11.73				0.44			C	1.80	3051.1	0.02

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
631	10/5/2017 0:48	1	11.85				C	2.95	3411.1	
632	10/5/2017 1:05	1	11.85	13.47	0.46		W	3.88	3091.7	
633	10/5/2017 1:22	1	11.86				UW	1.63	2205.2	
634	10/5/2017 1:38	1	11.85				U	2.95	2663.4	
635	10/5/2017 1:55	1	11.89				UW	2.28	2098.7	0.05
636	10/5/2017 2:11	1	11.88		0.48		U	1.60	1773.7	
637	10/5/2017 4:15	1	11.99				W	2.83	3742.8	0.07
638	10/5/2017 4:32	1	11.92		0.43		C	1.90	3128.5	0.02
639	10/5/2017 4:48	1	11.95				C	1.75	3260.5	
640	10/5/2017 5:05	1	12.03	13.40	0.45		W	2.35	2701.8	
641	10/5/2017 5:21	1	12.02				UW	2.17	2253.2	
642	10/5/2017 5:38	1	12.17				U	2.53	2494.7	0.02
643	10/5/2017 5:54	1	12.04				UW	2.51	1975.2	0.07
644	10/5/2017 6:11	1	12.14		0.48		U	2.79	1677.8	
645	10/5/2017 8:15	1	12.15				W	3.71	4622.8	0.04
646	10/5/2017 8:32	1	12.21		0.43		C	3.40	4007.2	0.01
647	10/5/2017 8:48	1	12.41				C	2.50	3398.7	
648	10/5/2017 9:05	1	12.61	13.49	0.45		W	2.30	3040.8	
649	10/5/2017 9:21	1	12.77				UW	2.20	2784.2	
650	10/5/2017 9:38	1	13.04				U	2.88	2593.1	0.05
651	10/5/2017 9:54	1	13.01				UW	2.64	2086.4	0.07
652	10/5/2017 10:11	1	12.60		0.48		U	1.78	2040.4	
653	10/5/2017 12:15	1	14.86				W	2.70	4236.9	0.06
654	10/5/2017 12:32	1	14.59		0.43		C	3.04	3454.5	0.01
655	10/5/2017 12:48	1	14.96				C	2.29	3529.6	
656	10/5/2017 13:05	1	14.77	16.14	0.46		W	2.71	3086.2	
657	10/5/2017 13:21	1	15.18				UW	3.92	2781.2	
658	10/5/2017 13:38	1	15.63				U	2.77	3204.2	0.12
659	10/5/2017 13:54	1	17.69				UW	1.92	2180.4	0.13
660	10/5/2017 14:11	1	19.66		0.49		U	3.85	2277.2	0.03
661	10/5/2017 16:15	1	19.01				W	3.81	5942.7	0.04
662	10/5/2017 16:32	1	18.49		0.43		C	3.35	3770.7	
663	10/5/2017 16:48	1	18.42				C	2.65	4472.5	
664	10/5/2017 17:05	1	18.10	18.88	0.45		W	3.78	4525.0	
665	10/5/2017 17:21	1	17.60				UW	3.92	3752.3	0.01
666	10/5/2017 17:38	1	16.43				U	3.47	3765.5	0.07
667	10/5/2017 17:54	1	16.42				UW	2.35	2775.5	
668	10/5/2017 18:11	1	16.13		0.48		U	4.18	2777.2	
669	10/5/2017 20:15	1	13.94				W	3.23	4672.6	0.01
670	10/5/2017 20:32	1	13.57		0.42		C	2.10	3700.3	
671	10/5/2017 20:48	1	12.17				C	3.04	3873.7	
672	10/5/2017 21:05	1	11.51	14.95	0.45		W	3.06	3175.4	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
673	10/5/2017 21:21	1		10.68							UW	2.78	2744.8	
674	10/5/2017 21:38	1		10.09							U	2.40	2708.3	
675	10/5/2017 21:54	1		10.10							UW	2.44	2161.5	
676	10/5/2017 22:11	1		9.72				0.48			U	2.64	2680.0	
677	10/6/2017 0:15	1		8.12							W	2.62	4349.1	
678	10/6/2017 0:32	1		7.88				0.42			C	2.93	3248.2	
679	10/6/2017 0:48	1		7.52							C	1.90	3404.9	
680	10/6/2017 1:05	1		7.54	11.50			0.44			W	3.13	2675.4	
681	10/6/2017 1:21	1		7.00							UW	2.55	2257.1	
682	10/6/2017 1:38	1		6.50							U	1.95	2178.0	
683	10/6/2017 1:54	1		7.13							UW	2.26	1945.1	
684	10/6/2017 2:11	1		6.84				0.48			U	2.58	2101.9	
685	10/6/2017 4:15	1		7.22							W	2.54	3985.6	
686	10/6/2017 4:32	1		7.22				0.42			C	2.45	3409.1	0.02
687	10/6/2017 4:48	1		6.60							C	1.72	3358.3	
688	10/6/2017 5:05	1		6.58	10.00			0.44			W	2.44	2764.7	
689	10/6/2017 5:21	1		6.10							UW	1.94	2361.5	
690	10/6/2017 5:38	1		4.92							U	1.70	2157.8	
691	10/6/2017 5:54	1		5.49							UW	2.23	1826.9	
692	10/6/2017 6:11	1		5.58				0.48			U	2.60	1978.7	
693	10/6/2017 8:15	1		9.18							W	3.39	4480.9	0.02
694	10/6/2017 8:32	1		9.01				0.42			C	3.40	4784.2	0.01
695	10/6/2017 8:48	1		9.09							C	3.01	3282.1	0.05
696	10/6/2017 9:05	1		9.44	11.09			0.45			W	2.57	2604.6	
697	10/6/2017 9:21	1		9.66							UW	1.30	1442.8	
698	10/6/2017 9:38	1		10.16							U	1.02	1154.4	
699	10/6/2017 9:54	1		10.46							UW	1.46	1019.5	
700	10/6/2017 10:11	1		10.64				0.49			U	2.07	994.3	
701	10/6/2017 12:15	1		12.64							W	3.33	4533.0	0.01
702	10/6/2017 12:32	1		13.98				0.45			C	2.82	1996.5	
703	10/6/2017 12:48	1		13.97							C	1.52	2197.3	0.16
704	10/6/2017 13:05	1		14.12	15.03			0.47			W	5.30	4314.6	0.01
705	10/6/2017 13:21	1		14.48							UW	2.44	2504.6	
706	10/6/2017 13:38	1		14.36							U	3.50	2650.1	
707	10/6/2017 13:54	1		15.57							UW	2.81	1936.2	0.05
708	10/6/2017 14:11	1		15.90				0.49			U	2.12	1279.2	0.05
709	10/6/2017 16:15	1		12.52							W	4.60	4919.1	0.03
710	10/6/2017 16:32	1		12.14				0.44			C	2.15	2477.3	
711	10/6/2017 16:48	1		12.01							C	2.73	3588.4	
712	10/6/2017 17:05	1		11.98	14.26			0.46			W	3.22	4102.8	
713	10/6/2017 17:21	1		11.82							UW	3.02	2620.5	
714	10/6/2017 17:38	1		11.58							U	2.47	2603.7	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
715	10/6/2017 17:54	1	11.76				UW	2.19	1970.1	0.01
716	10/6/2017 18:11	1	11.77		0.48		U	2.64	1444.3	
717	10/6/2017 20:15	1	11.34				W	3.41	4458.8	0.02
718	10/6/2017 20:32	1	11.20		0.44		C	2.98	3687.5	
719	10/6/2017 20:48	1	11.21				C	2.40	3377.4	
720	10/6/2017 21:05	1	11.25	13.20	0.46		W	3.93	3291.4	
721	10/6/2017 21:21	1	11.14				UW	2.22	3051.0	
722	10/6/2017 21:38	1	10.88				U	2.58	2652.0	
723	10/6/2017 21:54	1	11.01				UW	1.85	2101.8	
724	10/6/2017 22:11	1	11.15		0.48		U	1.73	1575.3	
725	10/7/2017 0:15	1	11.17				W	3.35	4494.8	0.01
726	10/7/2017 0:32	1	11.00		0.44		C	2.22	2662.6	
727	10/7/2017 0:48	1	10.98				C	2.55	3255.9	
728	10/7/2017 1:05	1	11.06	12.85	0.46		W	2.97	3450.6	
729	10/7/2017 1:21	1	10.99				UW	2.84	2491.8	
730	10/7/2017 1:38	1	10.88				U	2.74	2633.4	
731	10/7/2017 1:55	1	11.03				UW	2.25	2085.1	
732	10/7/2017 2:11	1	11.03		0.48		U	2.33	2056.0	
733	10/7/2017 4:15	1	10.72				W	3.67	3999.6	0.01
734	10/7/2017 4:32	1	10.61		0.43		C	2.96	3004.7	0.01
735	10/7/2017 4:48	1	10.61				C	2.81	3162.4	
736	10/7/2017 5:05	1	10.69	12.52	0.46		W	2.78	2977.2	
737	10/7/2017 5:21	1	10.58				UW	2.00	2605.2	
738	10/7/2017 5:38	1	10.03				U	2.00	2592.0	
739	10/7/2017 5:54	1	10.08				UW	2.04	2188.1	
740	10/7/2017 6:11	1	9.97		0.48		U	2.39	1461.2	
741	10/7/2017 8:15	1	9.31				W	2.96	3400.4	0.01
742	10/7/2017 8:32	1	9.26		0.43		C	2.79	2525.8	
743	10/7/2017 8:48	1	9.49				C	2.97	2909.9	
744	10/7/2017 9:05	1	9.57	12.00	0.46		W	2.70	2631.7	
745	10/7/2017 9:21	1	10.15				UW	1.71	1807.4	
746	10/7/2017 9:38	1	12.06				U	2.70	2222.0	0.01
747	10/7/2017 9:54	1	11.94				UW	2.64	1743.4	0.03
748	10/7/2017 10:11	1	10.36		0.48		U	1.61	1386.9	0.03
749	10/7/2017 12:15	1	19.82				W	1.79	2800.1	0.18
750	10/7/2017 12:32	1	21.54		0.43		C	3.19	4154.8	
751	10/7/2017 12:48	1	22.65				C	2.74	5372.8	
752	10/7/2017 13:05	1	22.65	20.75	0.45		W	2.94	3669.5	
753	10/7/2017 13:21	1	22.11				UW	3.91	3183.8	0.35
754	10/7/2017 13:38	1	22.02				U	2.99	2868.5	0.05
755	10/7/2017 13:54	1	23.07				UW	2.94	3052.6	
756	10/7/2017 14:11	1	23.73		0.48		U	5.88	2587.8	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
757	10/7/2017 16:15	1		23.20							W	1.74	2583.2	0.77
758	10/7/2017 16:32	1		22.90				0.42			C	1.74	3281.6	
759	10/7/2017 16:48	1		23.06							C	2.11	3410.2	
760	10/7/2017 17:05	1		22.08	19.99		0.44				W	2.68	3283.8	
761	10/7/2017 17:21	1		22.46							UW	3.48	2867.5	0.13
762	10/7/2017 17:38	1		22.50							U	2.92	2213.2	
763	10/7/2017 17:54	1		21.51							UW	3.28	2553.8	
764	10/7/2017 18:11	1		20.55			0.47				U	4.21	2493.1	
765	10/7/2017 20:15	1		10.09							W	2.41	3529.6	
766	10/7/2017 20:32	1		9.79			0.41				C	2.05	3016.6	
767	10/7/2017 20:48	1		9.72							C	2.90	3521.0	
768	10/7/2017 21:05	1		9.40	14.06		0.43				W	2.16	2976.5	
769	10/7/2017 21:21	1		9.62							UW	2.69	2776.7	
770	10/7/2017 21:38	1		10.23							U	2.32	2390.8	
771	10/7/2017 21:54	1		9.84							UW	2.76	2226.9	
772	10/7/2017 22:11	1		10.50			0.47				U	3.14	2625.6	
773	10/8/2017 0:15	1		7.78							W	2.89	3888.3	
774	10/8/2017 0:32	1		7.40			0.40				C	2.20	2837.2	
775	10/8/2017 0:49	1		7.07							C	2.35	3159.4	
776	10/8/2017 1:05	1		7.23	11.53		0.43				W	1.80	2688.6	
777	10/8/2017 1:22	1		8.47							UW	1.86	2832.1	
778	10/8/2017 1:38	1		10.08							U	2.53	2470.7	
779	10/8/2017 1:55	1		9.47							UW	2.63	2517.4	
780	10/8/2017 2:11	1		9.45			0.47				U	3.22	2735.9	
781	10/8/2017 4:15	1		9.40							W	4.02	4524.0	
782	10/8/2017 4:32	1		8.75			0.40				C	2.70	3296.9	
783	10/8/2017 4:48	1		8.12							C	2.05	3640.1	
784	10/8/2017 5:05	1		7.60	10.79		0.43				W	2.31	2931.8	
785	10/8/2017 5:21	1		8.11							UW	1.77	2764.4	
786	10/8/2017 5:38	1		9.61							U	1.88	2323.4	
787	10/8/2017 5:55	1		8.73							UW	2.72	2259.8	
788	10/8/2017 6:11	1		8.81			0.47				U	3.32	2065.1	
789	10/8/2017 8:15	1		8.42							W	2.89	3887.6	
790	10/8/2017 8:32	1		9.03			0.40				C	1.84	3041.6	
791	10/8/2017 8:48	1		8.52							C	2.68	3049.8	0.01
792	10/8/2017 9:05	1		11.09	11.24		0.43				W	2.43	2546.5	0.01
793	10/8/2017 9:21	1		12.22							UW	1.55	2264.1	0.01
794	10/8/2017 9:38	1		15.29							U	2.33	2362.8	0.01
795	10/8/2017 9:54	1		13.86							UW	1.99	2224.6	0.03
796	10/8/2017 10:11	1		12.76			0.47				U	2.31	1903.9	0.03
797	10/8/2017 12:15	1		18.15							W	4.01	4734.3	0.06
798	10/8/2017 12:32	1		18.83			0.40				C	2.54	3514.2	0.02

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
799	10/8/2017 12:48	1		19.63							C	2.54	3526.8	
800	10/8/2017 13:05	1		19.39	18.92	0.43					W	4.94	6577.4	
801	10/8/2017 13:21	1		19.95							UW	3.35	3023.0	0.08
802	10/8/2017 13:38	1		19.21							U	2.43	3169.8	0.14
803	10/8/2017 13:54	1		19.92							UW	2.39	3503.2	0.20
804	10/8/2017 14:11	1		20.70		0.46					U	4.00	3020.1	
805	10/8/2017 16:15	1		20.48							W	4.04	4893.5	0.03
806	10/8/2017 16:32	1		19.74		0.39					C	3.28	3460.9	
807	10/8/2017 16:48	1		20.09							C	2.97	3453.7	
808	10/8/2017 17:05	1		18.68	19.80	0.43					W	3.42	6070.6	
809	10/8/2017 17:21	1		18.44							UW	2.52	2717.8	0.03
810	10/8/2017 17:38	1		17.60							U	3.04	3714.6	0.05
811	10/8/2017 17:54	1		17.23							UW	2.85	3559.5	
812	10/8/2017 18:11	1		16.00		0.45					U	3.43	3070.3	
813	10/8/2017 20:15	1		9.98							W	2.74	4054.9	
814	10/8/2017 20:32	1		10.15		0.38					C	2.77	3213.2	
815	10/8/2017 20:48	1		9.91							C	1.83	2840.9	
816	10/8/2017 21:05	1		9.95	13.41	0.42					W	1.97	3151.6	
817	10/8/2017 21:21	1		9.53							UW	2.57	2647.6	
818	10/8/2017 21:38	1		10.29							U	2.01	3175.8	
819	10/8/2017 21:54	1		9.56							UW	1.95	2810.9	
820	10/8/2017 22:11	1		9.22		0.44					U	2.25	2477.1	
821	10/9/2017 0:15	1		7.04							W	2.63	3881.1	0.03
822	10/9/2017 0:32	1		6.55		0.38					C	2.12	2786.1	
823	10/9/2017 0:49	1		6.18							C	1.48	2948.7	
824	10/9/2017 1:05	1		6.50	10.42	0.41					W	1.63	2607.1	
825	10/9/2017 1:22	1		6.49							UW	2.07	2153.9	
826	10/9/2017 1:38	1		7.53							U	1.81	2229.4	
827	10/9/2017 1:55	1		7.53							UW	1.84	2150.8	
828	10/9/2017 2:11	1		7.75		0.44					U	2.74	2044.9	
829	10/9/2017 4:15	1		9.05							W	2.94	3545.8	0.04
830	10/9/2017 4:32	1		8.95		0.38					C	1.81	2791.2	0.01
831	10/9/2017 4:48	1		8.90							C	2.05	2381.0	0.01
832	10/9/2017 5:05	1		9.00	10.82	0.41					W	2.63	2912.5	
833	10/9/2017 5:21	1		8.61							UW	1.63	2064.0	
834	10/9/2017 5:38	1		8.65							U	1.34	2326.9	
835	10/9/2017 5:55	1		8.46							UW	1.75	2323.6	
836	10/9/2017 6:11	1		8.26		0.44					U	1.58	2122.2	
837	10/9/2017 8:15	1		7.32							W	3.35	3638.1	0.02
838	10/9/2017 8:32	1		7.08		0.38					C	2.28	2281.3	
839	10/9/2017 8:48	1		7.00							C	1.96	2389.7	
840	10/9/2017 9:05	1		7.08	9.88	0.41					W	2.35	3356.9	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
841	10/9/2017 9:21	1	6.75				UW	2.42	2165.8	
842	10/9/2017 9:38	1	6.61				U	1.87	2324.8	
843	10/9/2017 9:54	1	6.64				UW	2.52	2877.7	
844	10/9/2017 10:11	1	6.66		0.43		U	2.04	1991.8	
845	10/9/2017 12:15	1	6.84				W	2.85	3814.4	0.03
846	10/9/2017 12:32	1	6.04		0.37		C	3.40	2338.5	
847	10/9/2017 12:48	1	6.02				C	1.77	2601.1	
848	10/9/2017 13:05	1	6.23	9.62	0.41		W	2.19	3839.7	
849	10/9/2017 13:21	1	6.03				UW	1.89	1856.7	
850	10/9/2017 13:38	1	6.09				U	1.26	2437.6	
851	10/9/2017 13:54	1	6.43				UW	1.96	2339.5	
852	10/9/2017 14:11	1	6.46		0.43		U	2.56	1970.9	
853	10/9/2017 16:15	1	13.03				W	2.67	3183.0	0.04
854	10/9/2017 16:32	1	9.98		0.37		C	0.99	2093.8	0.39
855	10/9/2017 16:48	1	11.10				C	0.96	2197.5	
856	10/9/2017 17:05	1	9.21	12.73	0.41		W	2.25	4014.3	0.44
857	10/9/2017 17:21	1	10.79				UW	1.83	1505.5	
858	10/9/2017 17:38	1	8.56				U	1.98	2265.2	0.02
859	10/9/2017 17:54	1	9.19				UW	2.34	2439.1	0.87
860	10/9/2017 18:11	1	8.11		0.43		U	2.26	1715.3	
861	10/9/2017 20:15	1	0.84				W	1.56	2479.3	0.13
862	10/9/2017 20:32	1	0.40		0.36		C	1.13	2142.9	
863	10/9/2017 20:48	1	0.07				C	2.25	2411.0	
864	10/9/2017 21:05	1	0.17	7.19	0.40		W	1.22	2166.9	
865	10/9/2017 21:21	1	0.06				UW	0.72	1580.5	
866	10/9/2017 21:38	1	0.42				U	0.77	1646.2	
867	10/9/2017 21:55	1	0.41				UW	1.12	1956.5	
868	10/9/2017 22:11	1	-0.26		0.42		U	1.68	2210.4	
869	10/10/2017 0:15	1	-1.67				W	1.33	2504.3	0.05
870	10/10/2017 0:32	1	-1.77		0.36		C	1.56	1930.3	
871	10/10/2017 0:49	1	-2.12				C	1.04	2046.5	
872	10/10/2017 1:05	1	-1.83	4.54	0.40		W	1.59	1953.4	
873	10/10/2017 1:22	1	-2.07				UW	0.68	1832.1	
874	10/10/2017 1:38	1	-3.52				U	0.64	1345.6	
875	10/10/2017 1:55	1	-2.57				UW	0.94	1708.2	
876	10/10/2017 2:11	1	-2.67		0.42		U	1.60	1708.1	
877	10/10/2017 4:15	1	-3.40				W	1.47	2283.9	0.01
878	10/10/2017 4:32	1	-3.58		0.36		C	1.74	1892.7	
879	10/10/2017 4:48	1	-4.03				C	0.94	1888.3	
880	10/10/2017 5:05	1	-3.85	2.94	0.40		W	1.27	1856.3	
881	10/10/2017 5:21	1	-3.96				UW	0.64	1553.9	
882	10/10/2017 5:38	1	-5.25				U	0.56	1517.5	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
883	10/10/2017 5:55	1	-4.02				UW	0.90	1599.0	
884	10/10/2017 6:11	1	-3.77		0.42		U	1.49	1775.2	
885	10/10/2017 8:15	1	-3.30				W	2.42	2613.7	0.01
886	10/10/2017 8:32	1	-2.27		0.35		C	1.06	1680.4	
887	10/10/2017 8:48	1	-2.43				C	0.90	1750.7	0.01
888	10/10/2017 9:05	1	0.68	2.68	0.40		W	0.91	1710.7	0.01
889	10/10/2017 9:21	1	1.35				UW	0.54	1563.6	0.01
890	10/10/2017 9:38	1	4.53				U	0.57	1432.1	0.01
891	10/10/2017 9:55	1	3.96				UW	0.84	1516.8	0.01
892	10/10/2017 10:11	1	0.55		0.42		U	0.88	1637.4	0.02
893	10/10/2017 12:18	1	13.45				W	1.60	3006.3	0.24
894	10/10/2017 12:35	1	15.08		0.36		C	1.25	2532.6	0.01
895	10/10/2017 12:51	1	16.26				C	1.81	2506.4	0.01
896	10/10/2017 13:08	1	16.11	15.45	0.40		W	2.26	2716.0	
897	10/10/2017 13:24	1	14.95				UW	1.77	2479.3	
898	10/10/2017 13:41	1	13.30				U	1.14	2119.4	0.01
899	10/10/2017 13:57	1	16.26				UW	1.89	2233.3	0.05
900	10/10/2017 14:14	1	16.80		0.43		U	2.47	2369.0	0.01
901	10/10/2017 16:15	1	18.21				W	2.86	3980.6	0.18
902	10/10/2017 16:32	1	17.27		0.36		C	1.85	2686.9	
903	10/10/2017 16:48	1	17.17				C	1.54	2857.2	
904	10/10/2017 17:05	1	16.09	16.62	0.40		W	2.81	3262.9	
905	10/10/2017 17:21	1	16.07				UW	1.31	2391.3	0.06
906	10/10/2017 17:38	1	12.83				U	1.41	2310.9	0.11
907	10/10/2017 17:54	1	14.25				UW	2.32	2167.4	
908	10/10/2017 18:11	1	12.64		0.42		U	2.44	2276.2	
909	10/10/2017 20:15	1	2.42				W	1.54	3115.0	0.02
910	10/10/2017 20:32	1	2.25		0.35		C	2.30	2333.6	
911	10/10/2017 20:48	1	0.81				C	1.49	2233.8	
912	10/10/2017 21:05	1	0.80	8.28	0.40		W	1.71	2389.7	
913	10/10/2017 21:21	1	0.22				UW	0.73	1824.9	
914	10/10/2017 21:38	1	-0.09				U	0.75	1749.3	
915	10/10/2017 21:55	1	0.00				UW	1.88	1766.0	
916	10/10/2017 22:11	1	-0.24		0.42		U	1.46	1740.9	
917	10/11/2017 0:15	1	-0.94				W	1.53	2816.8	0.03
918	10/11/2017 0:32	1	-1.57		0.35		C	1.10	1817.3	
919	10/11/2017 0:49	1	-0.89				C	0.94	2327.4	
920	10/11/2017 1:05	1	-0.07	5.08	0.39		W	2.03	2162.2	
921	10/11/2017 1:22	1	-0.25				UW	0.68	1889.8	
922	10/11/2017 1:38	1	-0.97				U	0.71	1542.7	
923	10/11/2017 1:55	1	-0.63				UW	1.90	1870.1	
924	10/11/2017 2:11	1	-1.24		0.41		U	1.70	1648.7	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
925	10/11/2017 4:15	1	-3.05				W	1.34	2544.1	0.01
926	10/11/2017 4:32	1	-3.23		0.35		C	0.91	1691.3	
927	10/11/2017 4:48	1	-3.83				C	1.58	1967.5	
928	10/11/2017 5:05	1	-3.40	3.11	0.39		W	1.02	2043.2	
929	10/11/2017 5:21	1	-3.66				UW	0.64	1590.9	
930	10/11/2017 5:38	1	-4.31				U	0.64	1427.0	
931	10/11/2017 5:55	1	-3.68				UW	1.25	1739.8	
932	10/11/2017 6:11	1	-3.85		0.41		U	1.62	1730.4	
933	10/11/2017 8:15	1	-1.17				W	1.78	2640.6	0.01
934	10/11/2017 8:32	1	-0.56		0.34		C	1.00	1983.3	0.01
935	10/11/2017 8:48	1	-1.07				C	0.94	1946.3	0.01
936	10/11/2017 9:05	1	1.28	3.06	0.39		W	1.20	2295.7	0.01
937	10/11/2017 9:21	1	1.89				UW	0.59	1625.4	0.01
938	10/11/2017 9:38	1	4.65				U	0.59	1591.4	0.01
939	10/11/2017 9:55	1	4.21				UW	1.14	2183.2	0.01
940	10/11/2017 10:11	1	3.19		0.42		U	2.14	2378.6	0.02
941	10/11/2017 12:15	1	13.40				W	2.47	4485.3	0.27
942	10/11/2017 12:32	1	14.80		0.36		C	3.44	3516.4	0.03
943	10/11/2017 12:48	1	15.32				C	3.56	4111.7	0.01
944	10/11/2017 13:05	1	16.07	15.41	0.40		W	3.73	5755.2	
945	10/11/2017 13:21	1	15.42				UW	2.59	3137.7	
946	10/11/2017 13:38	1	15.14				U	1.57	2284.6	0.05
947	10/11/2017 13:54	1	17.18				UW	2.05	3963.0	0.03
948	10/11/2017 14:11	1	17.77		0.42		U	2.45	4330.6	0.04
949	10/11/2017 16:25	2	16.25			0.31	UW	0.48	814.8	0.03
950	10/11/2017 16:42	2	17.80		0.30		U	0.45	882.3	0.01
951	10/11/2017 16:58	2	16.63	14.58	0.30		UW	0.22	1369.0	0.38
952	10/11/2017 17:15	2	16.49				U	0.17	634.1	
953	10/11/2017 17:31	2	16.27				C	0.01	179.8	
954	10/11/2017 17:48	2	14.54				W	0.83	1103.5	
955	10/11/2017 18:04	2	14.35				C	0.04	361.9	
956	10/11/2017 18:21	2	13.47				W	0.62	616.5	
957	10/11/2017 20:24	2	7.93			0.31	UW	0.51	1090.5	
958	10/11/2017 20:41	2	8.02		0.29		U	0.22	660.4	
959	10/11/2017 20:57	2	7.55	10.56	0.29		UW	0.19	983.8	
960	10/11/2017 21:14	2	6.92				U	0.13	560.8	
961	10/11/2017 21:30	2	6.61				C	0.05	425.8	0.01
962	10/11/2017 21:47	2	5.86				W	0.49	781.8	
963	10/11/2017 22:03	2	4.66				C	0.12	439.1	
964	10/11/2017 22:20	2	4.97				W	0.39	520.7	
965	10/12/2017 0:15	2	5.58			0.31	UW	0.39	976.3	0.01
966	10/12/2017 0:32	2	5.37		0.29		U	0.64	635.5	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
967	10/12/2017 0:48	2		5.44		8.68		0.28			UW	0.20	962.1	
968	10/12/2017 1:05	2		5.92							U	0.14	502.6	0.01
969	10/12/2017 1:22	2		6.39							C	0.01	170.0	0.02
970	10/12/2017 1:38	2		6.18							W	0.61	834.0	
971	10/12/2017 1:55	2		5.81							C	0.06	357.7	
972	10/12/2017 2:11	2		6.53							W	0.29	483.2	
973	10/12/2017 4:15	2		5.48							0.31UW	0.46	929.1	0.03
974	10/12/2017 4:32	2		5.63				0.28			U	0.14	560.6	0.01
975	10/12/2017 4:48	2		5.57		8.07		0.28			UW	0.15	843.2	0.01
976	10/12/2017 5:05	2		5.59							U	0.08	475.7	0.05
977	10/12/2017 5:21	2		5.63							C	0.02	200.2	0.06
978	10/12/2017 5:38	2		5.76							W	0.55	918.5	
979	10/12/2017 5:54	2		5.72							C	0.07	295.2	
980	10/12/2017 6:11	2		6.66							W	0.18	362.0	
981	10/12/2017 8:15	2		6.87							0.31UW	0.33	808.9	0.06
982	10/12/2017 8:32	2		7.17				0.29			U	0.10	532.9	0.01
983	10/12/2017 8:48	2		8.15		8.33		0.28			UW	0.20	1018.4	0.02
984	10/12/2017 9:05	2		9.65							U	0.04	514.6	0.19
985	10/12/2017 9:21	2		10.97							C	0.02	185.4	0.27
986	10/12/2017 9:38	2		11.86							W	0.68	1022.2	
987	10/12/2017 9:54	2		12.98							C	0.05	249.1	
988	10/12/2017 10:11	2		12.34							W	0.13	329.0	
989	10/12/2017 12:15	2		19.28							0.31UW	0.45	1023.4	0.06
990	10/12/2017 12:32	2		19.52				0.30			U	0.09	626.1	0.34
991	10/12/2017 12:48	2		18.35		14.11		0.30			UW	0.18	1220.5	0.31
992	10/12/2017 13:05	2		20.45							U	0.05	627.7	
993	10/12/2017 13:21	2		20.91							C		233.1	
994	10/12/2017 13:38	2		19.92							W	1.17	2171.2	
995	10/12/2017 13:54	2		21.91							C	0.04	287.2	
996	10/12/2017 14:11	2		20.58							W	0.23	354.8	
997	10/12/2017 15:48	2		22.78							C	0.01	306.5	
998	10/12/2017 16:05	2		20.87							W	1.39	1869.0	
999	10/12/2017 16:23	2		22.58							C	0.04	364.7	
1000	10/12/2017 16:40	2		20.48							W	0.62	478.8	
1001	10/12/2017 16:57	2		19.31							0.32UW	0.57	797.6	0.02
1002	10/12/2017 17:15	2		19.64				0.30			U	0.27	480.0	0.13
1003	10/12/2017 17:32	2		20.57		17.18		0.30			UW	0.54	1202.9	0.40
1004	10/12/2017 17:49	2		19.04							U	0.12	586.9	
1005	10/12/2017 19:47	2		13.18							C	0.06	426.1	
1006	10/12/2017 20:05	2		12.67							W	0.51	826.3	
1007	10/12/2017 20:22	2		12.71							C	0.19	531.0	
1008	10/12/2017 20:39	2		12.79							W	0.62	539.5	

ID #	Date & Time	Run	A	Tmp S	Tmp N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1009	10/12/2017 20:56	2	12.51						0.31UW	0.58	829.4	
1010	10/12/2017 21:14	2	12.69			0.29			U	0.41	760.5	0.02
1011	10/12/2017 21:31	2	11.78	13.91	0.29				UW	0.19	755.7	0.31
1012	10/12/2017 21:48	2	10.94						U	0.51	864.8	
1013	10/12/2017 23:47	2	8.00						C	0.08	597.5	0.25
1014	10/13/2017 0:05	2	7.86						W	0.12	239.0	
1015	10/13/2017 0:20	2	6.75						C	0.07	450.5	
1016	10/13/2017 0:38	2	6.93						W	0.12	271.6	
1017	10/13/2017 0:55	2	5.66						C	0.17	703.0	
1018	10/13/2017 1:12	2	6.23						W	0.51	709.4	
1019	10/13/2017 1:30	2	5.75						0.31UW	0.56	934.5	
1020	10/13/2017 1:47	2	5.69		0.28				U	0.36	720.5	0.02
1021	10/13/2017 2:04	2	5.53	10.53	0.28				UW	0.10	496.9	0.16
1022	10/13/2017 2:21	2	4.95						U	0.39	829.2	
1023	10/13/2017 4:20	2	5.87						C	0.06	442.1	0.01
1024	10/13/2017 4:38	2	5.65						W	0.22	429.3	
1025	10/13/2017 4:55	2	5.49						C	0.14	631.7	
1026	10/13/2017 5:12	2	5.19						W	0.37	538.1	
1027	10/13/2017 5:29	2	6.16						0.31UW	0.47	901.6	
1028	10/13/2017 5:47	2	6.48		0.28				U	0.26	682.1	0.08
1029	10/13/2017 6:04	2	6.08	9.73	0.28				UW	0.12	787.9	0.38
1030	10/13/2017 6:21	2	6.04						U	0.19	700.9	
1031	10/13/2017 8:20	2	5.54						C	0.10	408.8	0.36
1032	10/13/2017 8:38	2	5.81						W	0.22	530.0	
1033	10/13/2017 8:55	2	5.92						C	0.17	668.5	
1034	10/13/2017 9:12	2	6.23						W	0.29	664.2	
1035	10/13/2017 9:29	2	7.18						0.31UW	0.48	974.0	
1036	10/13/2017 9:47	2	7.58		0.28				U	0.19	819.2	0.06
1037	10/13/2017 10:04	2	8.44	9.85	0.28				UW	0.09	765.9	0.67
1038	10/13/2017 10:21	2	10.12						U	0.19	959.4	
1039	10/13/2017 12:20	2	14.91						C	0.11	622.7	
1040	10/13/2017 12:38	2	14.00						W	0.11	439.0	
1041	10/13/2017 12:55	2	15.13						C	0.73	1029.6	0.01
1042	10/13/2017 13:12	2	12.06						W	0.50	835.6	
1043	10/13/2017 13:29	2	20.02						0.32UW	0.91	1289.4	0.35
1044	10/13/2017 13:47	2	18.84		0.30				U	0.32	855.0	0.23
1045	10/13/2017 14:04	2	16.26	14.95	0.29				UW	0.11	683.8	0.78
1046	10/13/2017 14:21	2	18.76						U	0.65	1016.3	0.12
1047	10/13/2017 16:20	2	19.49						C	0.18	738.6	
1048	10/13/2017 16:37	2	16.22						W	0.15	377.2	
1049	10/13/2017 16:55	2	18.77						C	0.23	1088.5	0.38
1050	10/13/2017 17:12	2	15.12						W	0.69	936.0	0.74

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1051	10/13/2017 17:29	2		13.01							0.31UW	0.77	1157.4	0.19
1052	10/13/2017 17:47	2		13.89				0.29			U	0.46	665.0	0.15
1053	10/13/2017 18:04	2		14.13	15.12			0.29			UW	0.30	599.1	0.73
1054	10/13/2017 18:21	2		13.12							U	0.54	776.3	0.06
1055	10/13/2017 20:20	2		5.01							C	0.06	494.9	
1056	10/13/2017 20:38	2		5.80							W	0.41	546.4	
1057	10/13/2017 20:55	2		5.59							C	0.57	709.8	
1058	10/13/2017 21:12	2		5.76							W	0.63	572.6	
1059	10/13/2017 21:29	2		5.86							0.31UW	0.64	890.7	0.05
1060	10/13/2017 21:47	2		6.11				0.28			U	0.24	607.3	
1061	10/13/2017 22:04	2		5.36	11.15			0.28			UW	0.12	526.0	0.42
1062	10/13/2017 22:21	2		5.41							U	0.21	622.6	
1063	10/14/2017 0:15	2		4.15							C	0.07	389.9	
1064	10/14/2017 0:33	2		3.90							W	0.22	572.1	
1065	10/14/2017 0:50	2		3.97							C	0.19	760.2	
1066	10/14/2017 1:07	2		4.83							W	0.58	684.6	
1067	10/14/2017 1:25	2		4.33							0.31UW	0.50	842.9	0.02
1068	10/14/2017 1:42	2		4.54				0.28			U	0.67	546.5	0.02
1069	10/14/2017 1:59	2		4.16	9.34			0.28			UW	0.13	499.6	0.38
1070	10/14/2017 2:16	2		4.44							U	0.38	603.4	
1071	10/14/2017 4:15	2		4.60							C	0.05	419.0	0.83
1072	10/14/2017 4:33	2		5.06							W	0.53	532.9	
1073	10/14/2017 4:50	2		5.04							C	0.11	561.2	
1074	10/14/2017 5:07	2		5.34							W	0.20	597.5	
1075	10/14/2017 5:24	2		5.49							0.31UW	0.65	750.1	0.02
1076	10/14/2017 5:42	2		5.30				0.28			U	0.20	660.3	0.02
1077	10/14/2017 5:59	2		5.03	9.01			0.28			UW	0.12	590.9	0.60
1078	10/14/2017 6:16	2		5.61							U	0.18	684.8	
1079	10/14/2017 8:15	2		7.85							C	0.09	431.6	
1080	10/14/2017 8:33	2		8.15							W	0.29	380.3	
1081	10/14/2017 8:50	2		8.41							C	0.14	744.4	
1082	10/14/2017 9:07	2		8.78							W	0.28	686.7	
1083	10/14/2017 9:24	2		9.05							0.31UW	0.60	951.1	0.08
1084	10/14/2017 9:42	2		9.54				0.28			U	0.38	583.6	0.33
1085	10/14/2017 9:59	2		9.99	9.92			0.28			UW	0.14	446.3	0.74
1086	10/14/2017 10:16	2		13.19							U	0.32	730.5	
1087	10/14/2017 12:15	2		16.16							C	0.09	517.3	
1088	10/14/2017 12:32	2		13.33							W	0.08	256.7	
1089	10/14/2017 12:50	2		12.41							C	0.13	982.2	
1090	10/14/2017 13:07	2		11.41							W	0.45	734.5	
1091	10/14/2017 13:24	2		10.73							0.31UW	0.71	1059.8	0.12
1092	10/14/2017 13:42	2		9.74				0.29			U	0.46	568.6	

ID #	Date & Time	Run A	Tmp S	Tmp N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1093	10/14/2017 13:59	2	9.39	12.62	0.28			UW	0.13	375.0	0.68
1094	10/14/2017 14:16	2	9.12					U	0.25	798.6	
1095	10/14/2017 16:15	2	7.27					C	0.12	757.8	
1096	10/14/2017 16:32	2	7.28					W		185.1	
1097	10/14/2017 16:50	2	7.44					C	0.18	1061.9	
1098	10/14/2017 17:07	2	6.96					W	0.51	773.5	
1099	10/14/2017 17:24	2	7.44					0.35UW	0.55	1061.8	
1100	10/14/2017 17:42	2	7.28		0.36			U	0.48	887.1	0.10
1101	10/14/2017 17:59	2	7.07	10.71	0.36			UW	0.05	302.6	0.11
1102	10/14/2017 18:16	2	7.16					U	0.16	718.9	
1103	10/14/2017 20:15	2	6.29					C	0.15	662.4	0.31
1104	10/14/2017 20:35	2	6.09					W	0.02	92.5	
1105	10/14/2017 20:53	2	5.98					C	0.14	988.0	
1106	10/14/2017 21:10	2	5.82					W	0.24	860.2	
1107	10/14/2017 21:27	2	5.97					0.37UW	0.51	933.4	
1108	10/14/2017 21:44	2	5.78		0.39			U	0.69	832.3	0.10
1109	10/14/2017 22:02	2	5.53	9.42	0.37			UW	0.05	247.3	0.08
1110	10/14/2017 22:19	2	5.43					U	0.15	888.2	0.63
1111	10/15/2017 0:15	2	4.64					C	0.16	732.9	0.10
1112	10/15/2017 0:33	2	4.79					W	0.07	235.8	
1113	10/15/2017 0:50	2	4.88					C	0.15	947.5	
1114	10/15/2017 1:07	2	4.49					W	0.42	845.2	
1115	10/15/2017 1:25	2	5.24					0.38UW	0.51	1118.2	
1116	10/15/2017 1:42	2	5.20		0.39			U	0.22	928.4	0.15
1117	10/15/2017 1:59	2	5.39	8.61	0.37			UW	0.05	481.4	0.15
1118	10/15/2017 2:16	2	5.32					U	0.11	1196.3	
1119	10/15/2017 4:15	2	2.30					C	0.10	676.4	1.59
1120	10/15/2017 4:33	2	2.08					W	0.06	208.8	
1121	10/15/2017 4:50	2	1.56					C	0.17	873.3	
1122	10/15/2017 5:07	2	1.79					W	0.21	812.0	
1123	10/15/2017 5:24	2	1.43					0.37UW	0.30	911.1	
1124	10/15/2017 5:42	2	1.06		0.38			U	0.19	849.9	0.13
1125	10/15/2017 5:59	2	0.96	6.60	0.36			UW	0.08	415.4	0.13
1126	10/15/2017 6:16	2	0.55					U	0.16	661.8	
1127	10/15/2017 8:15	2	-0.18					C	0.08	424.8	0.09
1128	10/15/2017 8:33	2	0.80					W	0.13	333.7	
1129	10/15/2017 8:50	2	1.43					C	0.11	557.9	
1130	10/15/2017 9:07	2	1.77					W	0.21	758.7	
1131	10/15/2017 9:24	2	4.98					0.37UW	0.23	892.8	0.02
1132	10/15/2017 9:42	2	5.66		0.38			U	0.20	1002.0	0.23
1133	10/15/2017 9:59	2	5.31	6.41	0.36			UW	0.09	671.8	0.54
1134	10/15/2017 10:16	2	8.14					U	0.13	839.8	0.02

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1135	10/15/2017 12:15	2		12.04							C	0.07	445.8	
1136	10/15/2017 12:32	2		11.11							W	0.67	1157.4	
1137	10/15/2017 12:50	2		12.68							C	0.05	706.8	
1138	10/15/2017 13:07	2		11.07							W	0.19	734.0	
1139	10/15/2017 13:24	2		14.97						0.36	UW	0.66	1449.0	0.64
1140	10/15/2017 13:42	2		13.41				0.36			U	0.57	1156.0	0.60
1141	10/15/2017 13:59	2		11.87	12.18			0.35			UW	0.12	948.7	1.08
1142	10/15/2017 14:16	2		14.02							U	0.17	1331.3	
1143	10/15/2017 16:15	2		16.22							C	0.07	431.2	
1144	10/15/2017 16:33	2		13.60							W	0.59	858.5	
1145	10/15/2017 16:50	2		14.80							C	0.08	778.4	
1146	10/15/2017 17:07	2		12.55							W	0.20	680.8	
1147	10/15/2017 17:24	2		11.19						0.35	UW	0.61	1040.5	0.60
1148	10/15/2017 17:42	2		13.42				0.35			U	0.46	925.4	0.74
1149	10/15/2017 17:59	2		12.05	12.02			0.34			UW	0.09	738.3	1.51
1150	10/15/2017 18:16	2		12.23							U	0.32	991.4	0.37
1151	10/15/2017 20:15	2		1.95							C	0.06	363.6	
1152	10/15/2017 20:33	2		1.49							W	0.17	553.7	
1153	10/15/2017 20:50	2		0.71							C	0.12	549.8	
1154	10/15/2017 21:07	2		-0.02							W	0.22	558.8	
1155	10/15/2017 21:24	2		0.91						0.34	UW	0.52	819.6	0.40
1156	10/15/2017 21:42	2		1.07				0.33			U	0.15	776.5	
1157	10/15/2017 21:59	2		0.48	8.11			0.33			UW	0.11	598.1	1.43
1158	10/15/2017 22:16	2		0.11							U	0.15	517.8	0.17
1159	10/16/2017 0:15	2		-1.31							C	0.04	403.4	
1160	10/16/2017 0:33	2		-1.25							W	0.15	514.9	
1161	10/16/2017 0:50	2		-2.14							C	0.08	493.1	
1162	10/16/2017 1:07	2		-2.40							W	0.15	415.9	
1163	10/16/2017 1:25	2		-1.65						0.33	UW	0.27	736.1	0.52
1164	10/16/2017 1:42	2		-1.90				0.33			U	0.13	666.7	0.34
1165	10/16/2017 2:02	2		-1.69	5.88			0.33			UW	0.08	439.3	1.88
1166	10/16/2017 2:19	2		-2.06							U	0.13	495.7	0.23
1167	10/16/2017 4:15	2		-2.47							C	0.05	295.6	
1168	10/16/2017 4:33	2		-2.63							W	0.13	421.2	
1169	10/16/2017 4:50	2		-3.37							C	0.09	450.7	
1170	10/16/2017 5:07	2		-3.31							W	0.12	485.0	
1171	10/16/2017 5:24	2		-2.86						0.33	UW	0.35	753.0	0.82
1172	10/16/2017 5:42	2		-3.16				0.32			U	0.11	599.8	0.25
1173	10/16/2017 6:02	2		-2.29	4.59			0.32			UW	0.08	494.3	1.82
1174	10/16/2017 6:19	2		-2.64							U	0.11	561.5	0.15
1175	10/16/2017 8:15	2		-1.56							C	0.05	356.1	
1176	10/16/2017 8:33	2		0.11							W	0.11	468.1	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1177	10/16/2017 8:50	2		0.88							C	0.07	394.6	
1178	10/16/2017 9:07	2		2.01							W	0.11	467.0	0.01
1179	10/16/2017 9:24	2		5.99							0.34UW	0.39	1161.2	0.12
1180	10/16/2017 9:42	2		7.38				0.33			U	0.09	790.9	0.59
1181	10/16/2017 10:02	2		8.07		5.45		0.33			UW	0.08	842.4	2.20
1182	10/16/2017 10:19	2		10.60							U	0.06	797.1	
1183	10/16/2017 12:15	2		18.46							C	0.04	291.7	
1184	10/16/2017 12:33	2		17.71							W	0.77	1271.0	
1185	10/16/2017 12:50	2		20.59							C		323.6	
1186	10/16/2017 13:07	2		19.84							W	0.12	312.2	
1187	10/16/2017 13:24	2		21.52							0.34UW	0.48	1335.9	3.53
1188	10/16/2017 13:42	2		21.85				0.34			U	0.08	819.2	1.97
1189	10/16/2017 13:59	2		18.18		13.46		0.33			UW	0.01	686.4	23.65
1190	10/16/2017 14:16	2		21.96							U	0.12	881.5	
1191	10/16/2017 16:15	2		23.24							C	0.04	277.9	
1192	10/16/2017 16:33	2		21.13							W	0.91	1637.8	
1193	10/16/2017 16:50	2		22.85							C	0.06	400.6	3.88
1194	10/16/2017 17:07	2		21.27							W	0.63	475.7	0.52
1195	10/16/2017 17:24	2		18.90							0.34UW	0.59	955.8	1.67
1196	10/16/2017 17:42	2		19.09				0.33			U	0.19	400.9	0.87
1197	10/16/2017 17:59	2		18.58		15.03		0.33			UW	0.14	951.4	12.03
1198	10/16/2017 18:16	2		17.58							U	0.25	835.1	
1199	10/16/2017 20:15	2		10.55							C	0.05	441.8	
1200	10/16/2017 20:33	2		10.28							W	0.22	626.0	
1201	10/16/2017 20:50	2		7.93							C	0.08	545.9	
1202	10/16/2017 21:07	2		7.92							W	0.47	493.5	
1203	10/16/2017 21:24	2		4.99							0.33UW	0.57	665.9	1.08
1204	10/16/2017 21:42	2		4.31				0.32			U	0.19	457.0	
1205	10/16/2017 22:02	2		4.07		10.60		0.32			UW	0.11	442.9	4.22
1206	10/16/2017 22:19	2		3.69							U	0.23	520.2	
1207	10/17/2017 0:15	2		1.76							C	0.07	329.9	
1208	10/17/2017 0:33	2		2.45							W	0.15	522.1	
1209	10/17/2017 0:50	2		1.36							C	0.09	485.4	
1210	10/17/2017 1:07	2		1.01							W	0.15	469.1	
1211	10/17/2017 1:25	2		1.61							0.33UW	0.40	711.7	0.81
1212	10/17/2017 1:42	2		1.41				0.32			U	0.12	591.9	
1213	10/17/2017 1:59	2		2.31		8.18		0.31			UW	0.04	277.7	8.79
1214	10/17/2017 2:16	2		1.23							U	0.18	560.1	
1215	10/17/2017 4:15	2		0.54							C	0.07	396.2	
1216	10/17/2017 4:33	2		0.45							W	0.17	454.1	
1217	10/17/2017 4:50	2		-0.05							C	0.09	521.4	
1218	10/17/2017 5:07	2		0.23							W	0.11	441.6	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1219	10/17/2017 5:24	2		-0.01							0.32UW	0.23	745.5	0.64
1220	10/17/2017 5:42	2		-0.17				0.31			U	0.12	501.0	0.04
1221	10/17/2017 5:59	2		0.15	6.61		0.31				UW	0.08	625.1	5.19
1222	10/17/2017 6:16	2		0.07							U	0.16	599.1	
1223	10/17/2017 8:15	2		-0.08							C	0.05	379.2	
1224	10/17/2017 8:33	2		2.23							W	0.15	512.9	
1225	10/17/2017 8:50	2		4.11							C	0.07	457.8	
1226	10/17/2017 9:07	2		5.01							W	0.11	449.0	0.16
1227	10/17/2017 9:24	2		9.73							0.33UW	0.27	1166.5	0.40
1228	10/17/2017 9:42	2		10.43				0.32			U	0.09	814.1	0.86
1229	10/17/2017 9:59	2		10.77	7.49		0.31				UW	0.09	1103.4	6.53
1230	10/17/2017 10:16	2		13.92							U	0.14	862.3	
1231	10/17/2017 12:15	2		22.83							C	0.09	409.9	
1232	10/17/2017 12:33	2		21.68							W	0.21	703.2	
1233	10/17/2017 12:50	2		26.01							C	0.07	652.7	
1234	10/17/2017 13:07	2		24.31							W	0.57	803.4	
1235	10/17/2017 13:24	2		27.44							0.34UW	0.78	1583.4	5.77
1236	10/17/2017 13:42	2		27.21				0.33			U	0.34	1307.1	0.13
1237	10/17/2017 13:59	2		22.60	16.67		0.32				UW	0.16	1061.1	16.62
1238	10/17/2017 14:16	2		27.03							U	0.37	1275.1	0.66
1239	10/17/2017 16:15	2		26.65							C	0.10	583.4	
1240	10/17/2017 16:32	2		22.83							W	0.92	5617.4	23.89
1241	10/17/2017 16:50	2		25.76							C	0.09	546.7	
1242	10/17/2017 17:07	2		23.80							W	0.46	1085.2	0.07
1243	10/17/2017 17:24	2		19.68							0.47UW	0.80	2233.9	4.54
1244	10/17/2017 17:42	2		23.54				0.33			U	0.43	566.7	0.58
1245	10/17/2017 17:59	2		20.01	17.66		0.31				UW	0.13	1632.8	13.09
1246	10/17/2017 18:16	2		19.93							U	0.41	630.9	0.14
1247	10/17/2017 20:15	2		10.21							C	0.09	458.2	
1248	10/17/2017 20:33	2		9.23							W	0.56	1206.4	
1249	10/17/2017 20:50	2		8.78							C	0.17	604.4	
1250	10/17/2017 21:07	2		9.26							W	0.59	498.0	
1251	10/17/2017 21:24	2		8.41							0.45UW	0.67	1100.3	3.17
1252	10/17/2017 21:42	2		9.21				0.31			U	0.24	489.8	
1253	10/17/2017 21:59	2		9.03	12.58		0.30				UW	0.12	1090.7	7.86
1254	10/17/2017 22:16	2		9.41							U	0.25	549.9	
1255	10/18/2017 0:15	2		9.07							C	0.07	381.9	
1256	10/18/2017 0:33	2		8.43							W	0.45	764.6	
1257	10/18/2017 0:50	2		8.93							C	0.06	555.1	
1258	10/18/2017 1:07	2		9.52							W	0.15	316.7	
1259	10/18/2017 1:25	2		8.69							0.45UW	0.66	847.1	1.42
1260	10/18/2017 1:42	2		8.82				0.31			U	0.14	372.4	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1261	10/18/2017 1:59	2		8.53		11.04		0.30			UW	0.04	941.6	4.76
1262	10/18/2017 2:17	2		8.74							U	0.13	368.4	
1263	10/18/2017 4:15	2		8.90							C	0.02	426.6	
1264	10/18/2017 4:33	2		8.58							W	0.50	780.5	
1265	10/18/2017 4:50	2		8.78							C	0.04	339.1	
1266	10/18/2017 5:07	2		9.49							W	0.08	302.2	
1267	10/18/2017 5:24	2		8.05						0.44	UW	0.65	720.2	1.16
1268	10/18/2017 5:42	2		8.25				0.31			U	0.09	341.9	
1269	10/18/2017 5:59	2		7.49		10.22		0.30			UW	0.12	838.6	4.06
1270	10/18/2017 6:16	2		7.03							U	0.14	356.1	
1271	10/18/2017 8:15	2		6.85							C	0.05	340.7	
1272	10/18/2017 8:33	2		8.22							W	0.15	612.8	
1273	10/18/2017 8:50	2		7.50							C	0.04	487.5	
1274	10/18/2017 9:07	2		9.02							W	0.46	408.0	
1275	10/18/2017 9:24	2		8.62						0.44	UW	0.33	587.9	1.21
1276	10/18/2017 9:42	2		10.52				0.31			U	0.13	565.4	
1277	10/18/2017 9:59	2		10.54		10.13		0.30			UW	0.13	984.6	9.88
1278	10/18/2017 10:16	2		12.91							U	0.18	686.7	
1279	10/18/2017 12:15	2		22.05							C	0.07	661.1	
1280	10/18/2017 12:33	2		19.43							W	0.01	198.3	17.07
1281	10/18/2017 12:50	2		23.93							C	0.13	931.4	
1282	10/18/2017 13:07	2		21.85							W	0.58	524.3	2.86
1283	10/18/2017 13:24	2		21.86						0.43	UW	0.61	1875.5	8.53
1284	10/18/2017 13:42	2		24.49				0.32			U	0.33	1149.2	
1285	10/18/2017 13:59	2		19.97		16.68		0.31			UW	0.06	1219.0	11.29
1286	10/18/2017 14:16	2		23.94							U	0.33	1179.2	
1287	10/18/2017 16:15	2		21.34							C	0.12	813.1	
1288	10/18/2017 16:33	2		18.18							W	0.08	217.1	8.92
1289	10/18/2017 16:50	2		21.27							C	0.19	1216.2	
1290	10/18/2017 17:07	2		18.07							W	0.61	838.9	0.16
1291	10/18/2017 17:24	2		14.88						0.40	UW	0.84	1400.0	8.95
1292	10/18/2017 17:42	2		18.64				0.31			U	0.57	879.7	
1293	10/18/2017 17:59	2		15.83		16.42		0.30			UW	0.11	911.8	18.43
1294	10/18/2017 18:16	2		15.72							U	0.45	789.5	
1295	10/18/2017 20:15	2		5.94							C	0.09	520.2	
1296	10/18/2017 20:33	2		6.40							W	0.19	386.8	
1297	10/18/2017 20:50	2		5.14							C	0.16	689.5	
1298	10/18/2017 21:07	2		5.44							W	0.41	505.5	
1299	10/18/2017 21:24	2		3.38						0.39	UW	0.69	773.5	7.87
1300	10/18/2017 21:45	2		3.09				0.30			U	0.20	320.6	
1301	10/18/2017 22:02	2		3.23		11.28		0.29			UW	0.13	532.0	16.27
1302	10/18/2017 22:19	2		2.75							U	0.20	363.1	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1303	10/19/2017 0:15	2		1.55							C	0.06	382.7	
1304	10/19/2017 0:33	2		1.99							W	0.17	392.6	
1305	10/19/2017 0:50	2		1.16							C	0.11	496.6	
1306	10/19/2017 1:07	2		1.01							W	0.22	432.6	
1307	10/19/2017 1:25	2		1.32							0.39UW	0.73	624.6	5.77
1308	10/19/2017 1:42	2		1.07				0.29			U	0.16	443.2	
1309	10/19/2017 1:59	2		1.81	8.96			0.29			UW	0.08	542.0	13.15
1310	10/19/2017 2:16	2		1.74							U	0.17	585.4	
1311	10/19/2017 4:15	2		1.00							C	0.05	378.8	
1312	10/19/2017 4:33	2		1.36							W	0.15	391.7	
1313	10/19/2017 4:50	2		0.56							C	0.08	484.9	
1314	10/19/2017 5:07	2		1.07							W	0.16	384.8	
1315	10/19/2017 5:24	2		0.72							0.39UW	0.26	687.6	5.18
1316	10/19/2017 5:42	2		0.08				0.29			U	0.12	426.6	
1317	10/19/2017 5:59	2		0.67	7.54			0.29			UW	0.06	417.1	12.04
1318	10/19/2017 6:16	2		-0.02							U	0.13	442.4	
1319	10/19/2017 8:15	2		2.16							C	0.06	396.7	
1320	10/19/2017 8:33	2		2.93							W	0.12	438.2	
1321	10/19/2017 8:50	2		3.78							C	0.07	421.6	
1322	10/19/2017 9:07	2		5.14							W	0.05	387.6	0.05
1323	10/19/2017 9:24	2		7.47							0.39UW	0.23	960.8	2.23
1324	10/19/2017 9:42	2		10.63				0.29			U	0.06	464.7	
1325	10/19/2017 9:59	2		11.10	8.23			0.29			UW	0.06	895.5	6.57
1326	10/19/2017 10:16	2		13.54							U	0.06	440.5	
1327	10/19/2017 12:15	2		20.14							C	0.04	181.1	
1328	10/19/2017 12:32	2		18.73							W	0.16	1334.7	
1329	10/19/2017 12:50	2		22.18							C	0.01	243.8	
1330	10/19/2017 13:07	2		21.64							W	0.07	254.5	
1331	10/19/2017 13:24	2		22.38							0.38UW	0.25	1516.9	12.98
1332	10/19/2017 13:42	2		23.95				0.31			U	0.07	342.9	
1333	10/19/2017 13:59	2		20.56	16.14			0.30			UW	0.05	1237.5	14.42
1334	10/19/2017 14:16	2		24.23							U	0.09	348.6	
1335	10/19/2017 16:15	2		24.64							C	0.03	213.5	
1336	10/19/2017 16:32	2		22.10							W	0.61	1770.7	6.41
1337	10/19/2017 16:50	2		23.88							C	0.04	287.5	
1338	10/19/2017 17:07	2		22.77							W	0.50	274.0	0.04
1339	10/19/2017 17:24	2		20.48							0.37UW	0.52	637.8	5.46
1340	10/19/2017 17:42	2		21.75				0.30			U	0.14	184.6	
1341	10/19/2017 17:59	2		19.81	17.54			0.29			UW	0.10	979.7	11.90
1342	10/19/2017 18:16	2		19.25							U	0.11	203.7	
1343	10/19/2017 20:15	2		15.00							C	0.03	282.1	
1344	10/19/2017 20:33	2		14.73							W	0.62	951.7	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1345	10/19/2017 20:50	2	15.18				C	0.03	271.9	
1346	10/19/2017 21:07	2	15.84				W	0.18	259.0	
1347	10/19/2017 21:24	2	14.60				0.37UW	0.65	652.9	2.38
1348	10/19/2017 21:42	2	14.37		0.30		U	0.13	168.7	
1349	10/19/2017 21:59	2	13.61	14.47	0.29		UW	0.13	852.4	4.85
1350	10/19/2017 22:16	2	13.84				U	0.07	196.0	
1351	10/20/2017 0:15	2	13.01				C	0.02	281.1	
1352	10/20/2017 0:33	2	12.75				W	0.35	832.9	
1353	10/20/2017 0:50	2	12.58				C	0.04	282.7	
1354	10/20/2017 1:07	2	13.33				W	0.26	365.8	
1355	10/20/2017 1:25	2	11.49				0.36UW	0.53	639.9	1.60
1356	10/20/2017 1:42	2	11.48		0.29		U	0.14	368.4	
1357	10/20/2017 1:59	2	10.77	13.09	0.28		UW	0.15	676.0	4.10
1358	10/20/2017 2:16	2	10.58				U	0.11	319.2	
1359	10/20/2017 4:15	2	11.35				C		315.6	
1360	10/20/2017 4:33	2	11.26				W	0.46	923.1	
1361	10/20/2017 4:50	2	11.21				C	0.03	298.3	
1362	10/20/2017 5:07	2	11.80				W	0.10	301.1	
1363	10/20/2017 5:24	2	10.95				0.36UW	0.68	674.5	1.24
1364	10/20/2017 5:42	2	10.77		0.29		U	0.06	269.3	
1365	10/20/2017 5:59	2	10.46	12.24	0.28		UW	0.12	731.3	2.52
1366	10/20/2017 6:16	2	10.57				U	0.07	250.4	
1367	10/20/2017 8:15	2	10.05				C		228.5	
1368	10/20/2017 8:33	2	10.54				W	0.25	955.6	
1369	10/20/2017 8:50	2	11.33				C	0.02	226.8	
1370	10/20/2017 9:07	2	12.08				W	0.04	198.1	0.04
1371	10/20/2017 9:24	2	13.14				0.36UW	0.24	705.0	1.04
1372	10/20/2017 9:42	2	14.55		0.29		U	0.06	265.1	
1373	10/20/2017 9:59	2	14.78	12.54	0.28		UW	0.06	942.6	2.59
1374	10/20/2017 10:16	2	16.42				U	0.05	286.3	
1375	10/20/2017 12:15	2	21.44				C		181.7	
1376	10/20/2017 12:32	2	21.24				W	0.15	1420.3	
1377	10/20/2017 12:50	2	23.42				C		246.8	
1378	10/20/2017 13:07	2	22.88				W	0.11	198.8	0.21
1379	10/20/2017 13:24	2	23.83				0.36UW	0.61	701.9	2.85
1380	10/20/2017 13:42	2	24.50		0.30		U	0.11	285.2	
1381	10/20/2017 13:59	2	22.33	18.46	0.29		UW	0.05	1156.1	3.01
1382	10/20/2017 14:16	2	25.20				U	0.05	252.2	
1383	10/20/2017 16:15	2	24.53				C	0.04	301.0	
1384	10/20/2017 16:32	2	22.48				W	0.09	1377.7	7.81
1385	10/20/2017 16:50	2	24.43				C	0.04	265.8	
1386	10/20/2017 17:07	2	23.64				W	0.07	316.7	0.26

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1387	10/20/2017 17:24	2		20.71							0.45UW	0.47	1359.2	2.01
1388	10/20/2017 17:42	2		22.61				0.30			U	0.10	129.4	
1389	10/20/2017 17:59	2		20.65	19.32			0.28			UW	0.03	786.7	2.51
1390	10/20/2017 18:16	2		20.88							U	0.06	139.9	
1391	10/20/2017 20:15	2		19.14							C		235.5	
1392	10/20/2017 20:32	2		18.72							W	0.03	563.9	
1393	10/20/2017 20:50	2		19.35							C	0.01	381.5	
1394	10/20/2017 21:07	2		19.74							W	0.08	214.0	0.25
1395	10/20/2017 21:24	2		17.96							0.45UW	0.67	706.3	1.49
1396	10/20/2017 21:42	2		18.25				0.29			U	0.10	170.9	
1397	10/20/2017 21:59	2		17.83	17.49			0.28			UW	0.03	740.9	1.97
1398	10/20/2017 22:16	2		18.52							U	0.07	182.0	
1399	10/21/2017 0:15	2		17.79							C	0.01	220.3	
1400	10/21/2017 0:33	2		17.36							W	0.01	275.7	
1401	10/21/2017 0:50	2		17.76							C		301.4	
1402	10/21/2017 1:07	2		18.11							W	0.06	169.2	
1403	10/21/2017 1:24	2		17.15							0.44UW	0.64	744.2	1.04
1404	10/21/2017 1:42	2		17.42				0.29			U	0.09	183.9	
1405	10/21/2017 1:59	2		16.72	16.88			0.28			UW	0.09	709.0	1.34
1406	10/21/2017 2:16	2		17.08							U	0.05	162.3	
1407	10/21/2017 4:15	2		15.90							C	0.01	256.2	
1408	10/21/2017 4:33	2		15.61							W	0.13	539.3	
1409	10/21/2017 4:50	2		15.68							C	0.03	275.7	
1410	10/21/2017 5:07	2		16.17							W	0.10	201.8	
1411	10/21/2017 5:24	2		15.63							0.44UW	0.70	694.2	1.02
1412	10/21/2017 5:42	2		15.81				0.29			U	0.09	223.2	
1413	10/21/2017 5:59	2		15.58	16.16			0.27			UW	0.08	680.3	1.12
1414	10/21/2017 6:16	2		16.42							U	0.06	247.8	
1415	10/21/2017 8:15	2		16.88							C	0.03	274.9	
1416	10/21/2017 8:32	2		16.75							W	0.05	465.8	
1417	10/21/2017 8:50	2		17.22							C	0.03	329.2	
1418	10/21/2017 9:07	2		17.18							W	0.09	191.5	
1419	10/21/2017 9:24	2		17.24							0.43UW	0.45	695.4	1.07
1420	10/21/2017 9:42	2		17.63				0.29			U	0.01	260.0	
1421	10/21/2017 9:59	2		17.56	16.75			0.28			UW	0.15	793.8	1.11
1422	10/21/2017 10:16	2		17.98							U	0.06	249.0	
1423	10/21/2017 12:15	2		15.24							C	0.03	475.9	
1424	10/21/2017 12:32	2		14.60							W	0.43	561.9	
1425	10/21/2017 12:50	2		14.83							C	0.17	676.1	
1426	10/21/2017 13:07	2		13.65							W	0.27	399.6	
1427	10/21/2017 13:24	2		13.72							0.43UW	0.88	718.4	1.00
1428	10/21/2017 13:42	2		14.27				0.29			U	0.22	486.1	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1429	10/21/2017 13:59	2		14.11		16.70		0.27			UW	0.69	744.5	0.79
1430	10/21/2017 14:16	2		14.52							U	0.41	394.6	
1431	10/21/2017 16:15	2		13.14							C	0.09	698.4	
1432	10/21/2017 16:32	2		12.31							W	0.67	628.5	0.37
1433	10/21/2017 16:50	2		12.82							C	0.08	605.9	
1434	10/21/2017 17:07	2		11.90							W	0.18	380.1	0.02
1435	10/21/2017 17:24	2		11.38						0.42	UW	0.77	1309.9	0.77
1436	10/21/2017 17:42	2		11.84				0.29			U	0.15	624.4	
1437	10/21/2017 17:59	2		11.95	15.21			0.27			UW	0.47	431.0	0.58
1438	10/21/2017 18:16	2		11.40							U	0.20	413.1	
1439	10/21/2017 20:15	2		7.42							C	0.03	393.7	
1440	10/21/2017 20:33	2		6.86							W	0.55	630.7	
1441	10/21/2017 20:50	2		6.44							C	0.12	649.7	
1442	10/21/2017 21:07	2		6.71							W	0.22	455.2	
1443	10/21/2017 21:24	2		6.05						0.41	UW	0.34	524.2	0.79
1444	10/21/2017 21:42	2		5.88				0.28			U	0.11	456.7	
1445	10/21/2017 21:59	2		5.80	12.18			0.27			UW	0.20	349.3	0.23
1446	10/21/2017 22:16	2		5.61							U	0.08	433.0	
1447	10/22/2017 0:15	2		4.67							C	0.04	340.4	
1448	10/22/2017 0:33	2		5.00							W	0.26	586.6	
1449	10/22/2017 0:50	2		4.49							C	0.06	556.7	
1450	10/22/2017 1:07	2		4.59							W	0.21	427.5	
1451	10/22/2017 1:25	2		4.39						0.41	UW	0.25	439.7	0.62
1452	10/22/2017 1:42	2		3.59				0.28			U	0.09	426.1	
1453	10/22/2017 1:59	2		3.91	10.18			0.26			UW	0.17	299.9	0.25
1454	10/22/2017 2:17	2		3.36							U	0.07	354.1	
1455	10/22/2017 4:15	2		1.44							C	0.03	316.9	
1456	10/22/2017 4:33	2		1.41							W	0.19	419.9	
1457	10/22/2017 4:50	2		0.24							C	0.07	393.4	
1458	10/22/2017 5:07	2		-0.15							W	0.12	320.7	
1459	10/22/2017 5:24	2		0.29						0.41	UW	0.17	423.0	1.14
1460	10/22/2017 5:42	2		-0.98				0.28			U	0.11	316.3	
1461	10/22/2017 5:59	2		-0.28	8.24			0.26			UW	0.09	238.5	0.36
1462	10/22/2017 6:16	2		-1.19							U	0.07	341.9	
1463	10/22/2017 8:15	2		-2.25							C	0.04	300.8	
1464	10/22/2017 8:33	2		-0.62							W	0.14	391.6	
1465	10/22/2017 8:50	2		1.15							C	0.05	357.7	
1466	10/22/2017 9:07	2		1.24							W	0.10	387.4	0.03
1467	10/22/2017 9:24	2		6.05						0.41	UW	0.13	620.3	0.13
1468	10/22/2017 9:42	2		7.42				0.28			U	0.08	471.0	
1469	10/22/2017 9:59	2		7.81	7.94			0.26			UW	0.09	415.2	0.64
1470	10/22/2017 10:16	2		10.72							U	0.04	467.4	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1471	10/22/2017 12:15	2	17.89				C	0.05	320.7	
1472	10/22/2017 12:32	2	16.84				W	0.16	897.3	10.44
1473	10/22/2017 12:50	2	20.32				C	0.05	305.8	
1474	10/22/2017 13:07	2	19.09				W	0.15	454.3	3.52
1475	10/22/2017 13:24	2	18.95				0.40UW	0.56	1216.6	4.16
1476	10/22/2017 13:42	2	20.54		0.29		U	0.08	456.9	
1477	10/22/2017 13:59	2	16.73	15.47	0.27		UW	0.10	660.8	0.24
1478	10/22/2017 14:16	2	20.99				U	0.04	504.6	
1479	10/22/2017 16:15	2	20.45				C	0.03	333.2	
1480	10/22/2017 16:32	2	17.85				W	0.65	1283.4	0.01
1481	10/22/2017 16:50	2	19.80				C	0.02	246.7	
1482	10/22/2017 17:07	2	18.22				W	0.13	319.1	0.09
1483	10/22/2017 17:24	2	15.72				0.38UW	0.82	596.7	3.27
1484	10/22/2017 17:42	2	17.83		0.29		U	0.07	178.5	
1485	10/22/2017 17:59	2	15.62	16.08	0.27		UW	0.19	633.8	2.24
1486	10/22/2017 18:16	2	15.69				U	0.10	217.9	
1487	10/22/2017 20:15	2	8.92				C	0.04	323.6	
1488	10/22/2017 20:33	2	8.55				W	0.36	559.5	0.01
1489	10/22/2017 20:50	2	9.99				C	0.04	430.6	
1490	10/22/2017 21:07	2	10.18				W	0.13	293.3	0.03
1491	10/22/2017 21:24	2	9.97				0.37UW	0.62	502.9	1.56
1492	10/22/2017 21:42	2	10.72		0.28		U	0.09	293.0	
1493	10/22/2017 21:59	2	10.56	12.79	0.26		UW	0.10	455.9	1.01
1494	10/22/2017 22:16	2	10.69				U	0.07	288.3	
1495	10/23/2017 0:15	2	7.11				C	0.01	297.0	
1496	10/23/2017 0:33	2	7.41				W	0.19	550.3	0.03
1497	10/23/2017 0:50	2	8.78				C	0.04	386.0	
1498	10/23/2017 1:07	2	8.94				W	0.15	370.3	0.02
1499	10/23/2017 1:25	2	8.59				0.37UW	0.42	573.1	1.05
1500	10/23/2017 1:42	2	8.75		0.28		U	0.09	287.5	
1501	10/23/2017 1:59	2	8.64	11.54	0.26		UW	0.09	435.2	0.66
1502	10/23/2017 2:16	2	8.73				U	0.08	309.4	
1503	10/23/2017 4:15	2	4.82				C	0.05	338.2	
1504	10/23/2017 4:33	2	6.36				W	0.18	442.2	
1505	10/23/2017 4:50	2	8.57				C	0.11	662.6	
1506	10/23/2017 5:07	2	9.26				W	0.08	543.3	0.05
1507	10/23/2017 5:24	2	9.54				0.37UW	0.38	801.4	0.61
1508	10/23/2017 5:42	2	9.79		0.28		U	0.10	658.5	
1509	10/23/2017 5:59	2	10.04	10.93	0.26		UW	0.11	301.1	0.39
1510	10/23/2017 6:16	2	10.29				U	0.11	509.0	
1511	10/23/2017 8:15	2	7.79				C	0.05	407.0	
1512	10/23/2017 8:33	2	7.82				W	0.14	347.6	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1513	10/23/2017 8:50	2	8.35				C	0.07	639.5	
1514	10/23/2017 9:07	2	8.33				W	0.10	524.6	0.07
1515	10/23/2017 9:24	2	11.38				0.36UW	0.23	923.0	0.38
1516	10/23/2017 9:42	2	12.21		0.28		U	0.10	529.8	
1517	10/23/2017 9:59	2	11.36	11.03	0.26		UW	0.14	329.1	0.30
1518	10/23/2017 10:16	2	13.71				U	0.11	541.0	
1519	10/23/2017 12:15	2	12.13				C	0.03	759.7	
1520	10/23/2017 12:33	2	10.78				W	0.05	186.8	0.26
1521	10/23/2017 12:50	2	11.10				C		775.7	
1522	10/23/2017 13:07	2	10.55				W	0.02	653.2	0.02
1523	10/23/2017 13:24	2	10.21				0.36UW	0.20	1026.9	0.32
1524	10/23/2017 13:42	2	10.13		0.28		U	0.05	683.6	
1525	10/23/2017 13:59	2	9.90	12.31	0.26		UW	0.06	180.3	0.20
1526	10/23/2017 14:16	2	12.75				U	0.03	654.0	
1527	10/23/2017 16:15	2	13.17				C		1125.5	
1528	10/23/2017 16:33	2	11.30				W	0.09	110.6	0.04
1529	10/23/2017 16:50	2	11.81				C	0.04	1063.5	
1530	10/23/2017 17:07	2	11.24				W	0.02	360.0	0.03
1531	10/23/2017 17:24	2	11.24				0.35UW	0.41	1558.4	0.42
1532	10/23/2017 17:42	2	10.99		0.28		U	0.07	656.3	
1533	10/23/2017 17:59	2	10.10	12.75	0.26		UW	0.11	153.4	0.22
1534	10/23/2017 18:16	2	10.19				U	0.09	524.1	
1535	10/23/2017 20:15	2	8.75				C		930.7	
1536	10/23/2017 20:33	2	8.71				W	0.04	83.8	
1537	10/23/2017 20:50	2	8.21				C	0.04	797.1	
1538	10/23/2017 21:07	2	8.33				W	0.01	690.0	
1539	10/23/2017 21:24	2	7.98				0.35UW	0.23	834.9	0.15
1540	10/23/2017 21:42	2	8.56		0.27		U	0.04	707.6	
1541	10/23/2017 21:59	2	8.51	11.02	0.26		UW	0.04	115.3	0.13
1542	10/23/2017 22:16	2	8.48				U	0.05	680.1	
1543	10/24/2017 0:15	2	4.86				C		1322.1	
1544	10/24/2017 0:33	2	4.68				W	0.03	87.1	
1545	10/24/2017 0:50	2	3.98				C	0.06	969.9	
1546	10/24/2017 1:07	2	4.13				W	0.02	445.1	
1547	10/24/2017 1:25	2	4.18				0.35UW	0.17	966.1	0.04
1548	10/24/2017 1:42	2	4.03		0.27		U	0.06	567.7	
1549	10/24/2017 1:59	2	3.67	8.89	0.25		UW	0.03	61.4	0.03
1550	10/24/2017 2:16	2	2.59				U	0.04	669.4	
1551	10/24/2017 4:15	2	0.53				C	0.01	1157.3	
1552	10/24/2017 4:33	2	0.68				W	0.02	65.3	
1553	10/24/2017 4:50	2	0.23				C	0.03	1034.4	
1554	10/24/2017 5:07	2	0.34				W	0.03	570.4	

ID #	Date & Time	Run	A	Tmp S	Tmp N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1555	10/24/2017 5:25	2	0.66						0.34UW	0.03	767.8	
1556	10/24/2017 5:42	2	0.49			0.26			U	0.05	470.2	0.13
1557	10/24/2017 5:59	2	0.51	6.58		0.25			UW	0.03	61.0	0.01
1558	10/24/2017 6:16	2	0.28						U	0.05	598.3	0.09
1559	10/24/2017 8:15	2	-0.39						C	0.01	995.6	0.05
1560	10/24/2017 8:33	2	0.56						W		70.8	
1561	10/24/2017 8:50	2	1.56						C	0.04	667.4	
1562	10/24/2017 9:07	2	1.19						W	0.03	317.7	0.01
1563	10/24/2017 9:24	2	3.46						0.34UW	0.09	840.2	
1564	10/24/2017 9:42	2	4.01			0.27			U		500.9	0.16
1565	10/24/2017 9:59	2	3.44	6.24		0.25			UW	0.02	124.8	0.03
1566	10/24/2017 10:16	2	5.32						U	0.05	826.5	
1567	10/24/2017 12:15	2	9.94						C	0.01	934.2	0.52
1568	10/24/2017 12:33	2	8.02						W		65.8	
1569	10/24/2017 12:50	2	11.40						C	0.02	810.7	
1570	10/24/2017 13:07	2	8.82						W	0.02	515.5	0.02
1571	10/24/2017 13:24	2	11.39						0.35UW	0.10	1283.9	0.12
1572	10/24/2017 13:42	2	11.73			0.27			U	0.03	708.6	
1573	10/24/2017 13:59	2	9.28	11.25		0.26			UW	0.06	150.2	0.08
1574	10/24/2017 14:16	2	12.45						U	0.05	1037.7	
1575	10/24/2017 16:15	2	12.59						C	0.02	929.1	
1576	10/24/2017 16:33	2	10.72						W	0.04	78.1	0.01
1577	10/24/2017 16:50	2	11.98						C	0.04	964.3	
1578	10/24/2017 17:07	2	9.81						W	0.05	553.5	0.01
1579	10/24/2017 17:24	2	8.80						0.34UW	0.36	1229.4	0.16
1580	10/24/2017 17:42	2	10.45			0.27			U	0.06	542.5	
1581	10/24/2017 17:59	2	9.43	11.58		0.25			UW	0.08	111.3	0.08
1582	10/24/2017 18:16	2	8.79						U	0.08	402.9	
1583	10/24/2017 20:15	2	3.73						C	0.06	437.3	
1584	10/24/2017 20:33	2	3.95						W	0.07	230.0	
1585	10/24/2017 20:50	2	3.03						C	0.05	553.8	
1586	10/24/2017 21:07	2	3.80						W	0.08	602.7	
1587	10/24/2017 21:24	2	3.06						0.34UW	0.15	489.4	0.03
1588	10/24/2017 21:42	2	3.49			0.26			U	0.09	464.5	
1589	10/24/2017 21:59	2	3.18	8.35		0.25			UW	0.06	113.2	0.03
1590	10/24/2017 22:16	2	2.22						U	0.07	350.5	
1591	10/25/2017 0:15	2	2.18						C	0.05	378.2	0.12
1592	10/25/2017 0:33	2	2.81						W	0.08	337.0	
1593	10/25/2017 0:50	2	3.62						C	0.05	454.4	
1594	10/25/2017 1:07	2	3.75						W	0.07	420.7	
1595	10/25/2017 1:25	2	4.45						0.34UW	0.14	606.4	0.02
1596	10/25/2017 1:42	2	3.63			0.26			U	0.08	323.3	1.39

ID #	Date & Time	Run	A	Tmp S	Tmp N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1597	10/25/2017 1:59	2		3.82	7.66	0.25			UW	0.08	237.9	0.04
1598	10/25/2017 2:16	2		4.60					U	0.05	455.6	
1599	10/25/2017 4:15	2		6.12					C	0.04	535.9	0.38
1600	10/25/2017 4:32	2		6.61					W	0.06	224.5	
1601	10/25/2017 4:50	2		6.07					C	0.05	526.4	
1602	10/25/2017 5:07	2		7.04					W	0.03	493.4	
1603	10/25/2017 5:24	2		5.51					0.34UW	0.14	590.3	0.07
1604	10/25/2017 5:42	2		5.09		0.26			U	0.08	434.9	
1605	10/25/2017 5:59	2		5.13	7.58	0.25			UW	0.07	166.3	0.07
1606	10/25/2017 6:16	2		4.40					U	0.06	470.3	
1607	10/25/2017 8:15	2		2.11					C	0.09	340.8	0.41
1608	10/25/2017 8:33	2		3.46					W	0.09	279.3	
1609	10/25/2017 8:50	2		5.69					C	0.01	432.4	
1610	10/25/2017 9:07	2		5.87					W	0.08	388.6	0.01
1611	10/25/2017 9:24	2		9.33					0.34UW	0.12	567.0	0.03
1612	10/25/2017 9:42	2		10.71		0.27			U	0.07	435.8	1.03
1613	10/25/2017 9:59	2		10.49	7.81	0.25			UW	0.06	389.5	0.15
1614	10/25/2017 10:16	2		13.17					U	0.07	520.6	
1615	10/25/2017 12:15	2		19.04					C	0.02	422.2	
1616	10/25/2017 12:32	2		16.35					W	0.13	594.1	
1617	10/25/2017 12:50	2		19.54					C	0.05	648.6	
1618	10/25/2017 13:07	2		16.98					W	0.40	674.4	0.03
1619	10/25/2017 13:24	2		20.98					0.35UW	0.59	795.9	0.61
1620	10/25/2017 13:42	2		21.27		0.28			U	0.13	712.4	
1621	10/25/2017 13:59	2		16.49	14.69	0.26			UW	0.08	292.4	0.22
1622	10/25/2017 14:16	2		19.61					U	0.07	634.8	0.03
1623	10/25/2017 16:15	2		21.07					C	0.06	529.6	
1624	10/25/2017 16:33	2		18.47					W	0.08	1212.2	0.04
1625	10/25/2017 16:50	2		19.31					C	0.09	559.3	
1626	10/25/2017 17:07	2		17.49					W	0.26	930.8	0.05
1627	10/25/2017 17:24	2		15.08					0.45UW	0.57	569.6	1.26
1628	10/25/2017 17:42	2		15.71		0.28			U	0.15	361.7	
1629	10/25/2017 17:59	2		13.38	15.00	0.26			UW	0.12	583.2	1.00
1630	10/25/2017 18:16	2		14.32					U	0.11	350.1	
1631	10/25/2017 20:15	2		7.12					C	0.04	420.7	
1632	10/25/2017 20:33	2		7.03					W	0.32	723.6	
1633	10/25/2017 20:50	2		5.18					C	0.08	457.7	
1634	10/25/2017 21:07	2		5.88					W	0.15	338.0	
1635	10/25/2017 21:24	2		5.51					0.45UW	0.41	280.1	0.42
1636	10/25/2017 21:42	2		5.59		0.27			U	0.07	325.4	
1637	10/25/2017 21:59	2		5.64	10.65	0.25			UW	0.14	493.1	0.23
1638	10/25/2017 22:16	2		6.19					U	0.06	350.6	

ID #	Date & Time	Run	A	Tmp S	Tmp N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1639	10/26/2017 0:15	2		7.59					C	0.01	370.0	
1640	10/26/2017 0:33	2		7.16					W	0.13	445.9	
1641	10/26/2017 0:50	2		7.52					C	0.03	386.7	
1642	10/26/2017 1:07	2		7.81					W	0.05	135.9	0.06
1643	10/26/2017 1:24	2		7.61					0.44UW	0.17	340.6	0.14
1644	10/26/2017 1:42	2		7.52		0.26			U	0.04	225.1	
1645	10/26/2017 1:59	2		6.68	9.73	0.25			UW	0.09	457.7	0.16
1646	10/26/2017 2:16	2		6.77					U	0.03	143.6	
1647	10/26/2017 4:15	2		5.98					C	0.04	294.5	
1648	10/26/2017 4:33	2		6.05					W	0.04	322.1	
1649	10/26/2017 4:50	2		5.60					C	0.05	316.1	
1650	10/26/2017 5:07	2		5.68					W	0.09	219.1	
1651	10/26/2017 5:24	2		6.31					0.44UW	0.09	203.5	0.15
1652	10/26/2017 5:42	2		6.22		0.26			U	0.05	296.0	
1653	10/26/2017 5:59	2		7.38	9.23	0.25			UW	0.17	445.4	0.15
1654	10/26/2017 6:16	2		8.84					U	0.09	410.7	
1655	10/26/2017 8:15	2		8.56					C	0.02	520.1	
1656	10/26/2017 8:32	2		8.55					W	0.07	158.4	
1657	10/26/2017 8:50	2		8.49					C	0.03	568.8	
1658	10/26/2017 9:07	2		8.79					W	0.04	111.3	0.07
1659	10/26/2017 9:24	2		7.84					0.43UW	0.16	745.1	0.15
1660	10/26/2017 9:42	2		8.44		0.26			U	0.05	463.1	
1661	10/26/2017 9:59	2		7.11	9.56	0.25			UW	0.06	363.0	0.10
1662	10/26/2017 10:16	2		7.28					U	0.05	475.7	
1663	10/26/2017 12:15	2		7.28					C		1017.4	
1664	10/26/2017 12:33	2		6.94					W	0.04	118.1	0.11
1665	10/26/2017 12:50	2		6.94					C	0.03	729.4	
1666	10/26/2017 13:07	2		6.03					W	0.03	256.1	0.01
1667	10/26/2017 13:24	2		5.89					0.42UW	0.18	1503.7	0.02
1668	10/26/2017 13:42	2		5.87		0.26			U	0.03	363.5	
1669	10/26/2017 13:59	2		5.21	9.59	0.25			UW	0.02	228.3	0.06
1670	10/26/2017 14:16	2		5.82					U	0.02	620.5	
1671	10/26/2017 16:15	2		3.30					C		630.8	
1672	10/26/2017 16:32	2		2.69					W	0.01	73.7	0.01
1673	10/26/2017 16:50	2		2.72					C		919.2	
1674	10/26/2017 17:07	2		2.02					W		104.3	
1675	10/26/2017 17:24	2		2.28					0.41UW	0.10	882.9	
1676	10/26/2017 17:42	2		2.21		0.26			U	0.02	624.1	0.17
1677	10/26/2017 17:59	2		1.81	7.71	0.25			UW	0.03	150.0	0.02
1678	10/26/2017 18:16	2		2.00					U	0.04	804.6	
1679	10/26/2017 20:15	2		0.82					C		1017.9	
1680	10/26/2017 20:32	2		0.48					W		33.5	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1681	10/26/2017 20:50	2		0.40							C		729.2	
1682	10/26/2017 21:07	2		-0.12							W		152.6	
1683	10/26/2017 21:24	2		-0.04							0.40UW	0.02	286.9	
1684	10/26/2017 21:42	2		0.04				0.26			U	0.02	488.9	0.11
1685	10/26/2017 21:59	2		-0.28		5.92		0.24			UW		88.0	0.01
1686	10/26/2017 22:16	2		-0.13							U	0.03	671.1	
1687	10/27/2017 0:15	2		-0.75							C	0.01	1023.0	
1688	10/27/2017 0:33	2		-0.84							W		29.7	
1689	10/27/2017 0:50	2		-0.95							C	0.01	849.6	
1690	10/27/2017 1:07	2		-1.42							W	0.01	299.1	
1691	10/27/2017 1:25	2		-1.19							0.38UW		300.9	
1692	10/27/2017 1:42	2		-1.55				0.26			U	0.01	507.6	0.02
1693	10/27/2017 1:59	2		-1.64		4.63		0.24			UW		87.3	
1694	10/27/2017 2:16	2		-1.61							U	0.02	494.6	
1695	10/27/2017 4:15	2		-1.67							C		998.2	0.02
1696	10/27/2017 4:33	2		-1.60							W		91.9	
1697	10/27/2017 4:50	2		-1.84							C		704.6	
1698	10/27/2017 5:07	2		-2.12							W	0.02	143.9	
1699	10/27/2017 5:24	2		-1.61							0.37UW	0.01	276.0	
1700	10/27/2017 5:42	2		-1.96				0.25			U	0.02	443.5	0.01
1701	10/27/2017 5:59	2		-2.04		3.78		0.24			UW		53.4	
1702	10/27/2017 6:16	2		-2.04							U		845.7	
1703	10/27/2017 8:15	2		-2.11							C		1209.7	0.02
1704	10/27/2017 8:33	2		-1.97							W	0.02	22.2	
1705	10/27/2017 8:50	2		-2.05							C	0.02	723.1	
1706	10/27/2017 9:07	2		-2.34							W		149.6	
1707	10/27/2017 9:24	2		-1.65							0.36UW		163.7	
1708	10/27/2017 9:42	2		-1.91				0.25			U		690.6	0.01
1709	10/27/2017 9:59	2		-2.08		3.46		0.24			UW	0.01	43.2	
1710	10/27/2017 10:16	2		-1.58							U		1036.9	
1711	10/27/2017 12:15	2		-0.06							C		881.9	0.03
1712	10/27/2017 12:33	2		-0.42							W		27.2	0.01
1713	10/27/2017 12:50	2		0.14							C	0.01	692.9	
1714	10/27/2017 13:07	2		-0.86							W		373.5	
1715	10/27/2017 13:24	2		0.35							0.36UW		315.7	
1716	10/27/2017 13:42	2		0.40				0.26			U	0.01	564.2	0.07
1717	10/27/2017 13:59	2		0.10		4.87		0.24			UW		45.0	
1718	10/27/2017 14:16	2		1.83							U		934.8	
1719	10/27/2017 16:15	2		2.89							C	0.03	1339.0	0.01
1720	10/27/2017 16:33	2		1.29							W		50.6	
1721	10/27/2017 16:50	2		3.48							C	0.01	695.3	
1722	10/27/2017 17:07	2		1.10							W		426.2	0.01

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1723	10/27/2017 17:24	2		0.35							0.38UW		369.3	
1724	10/27/2017 17:42	2		1.89				0.26			U	0.01	489.3	0.05
1725	10/27/2017 17:59	2		0.93	5.36		0.24				UW		61.6	
1726	10/27/2017 18:16	2		0.35							U	0.03	759.1	
1727	10/27/2017 20:15	2		-5.16							C	0.07	383.9	0.07
1728	10/27/2017 20:33	2		-4.42							W	0.03	85.2	
1729	10/27/2017 20:50	2		-5.49							C	0.03	366.8	
1730	10/27/2017 21:07	2		-5.22							W	0.01	272.1	
1731	10/27/2017 21:24	2		-3.53							0.36UW	0.06	413.4	
1732	10/27/2017 21:42	2		-4.55				0.25			U	0.01	299.0	0.05
1733	10/27/2017 21:59	2		-3.94	2.72		0.24				UW	0.02	85.6	
1734	10/27/2017 22:16	2		-4.52							U	0.01	362.0	
1735	10/28/2017 0:15	2		-6.47							C	0.03	358.4	0.02
1736	10/28/2017 0:33	2		-5.83							W	0.02	101.1	
1737	10/28/2017 0:50	2		-6.91							C	0.05	302.0	
1738	10/28/2017 1:07	2		-7.11							W	0.02	393.5	
1739	10/28/2017 1:24	2		-5.87							0.32UW	0.04	271.3	
1740	10/28/2017 1:42	2		-7.16				0.23			U	0.05	260.8	0.08
1741	10/28/2017 1:59	2		-7.20	1.80		0.22				UW	0.03	60.3	
1742	10/28/2017 2:16	2		-8.16							U	0.04	289.0	
1743	10/28/2017 4:15	2		-10.71							C	0.04	232.0	0.03
1744	10/28/2017 4:33	2		-9.60							W	0.03	110.2	
1745	10/28/2017 4:50	2		-11.72							C	0.03	226.8	
1746	10/28/2017 5:07	2		-12.15							W	0.05	254.6	
1747	10/28/2017 5:24	2		-10.28							0.27UW	0.04	246.5	0.02
1748	10/28/2017 5:42	2		-11.81				0.20			U	0.02	186.2	
1749	10/28/2017 5:59	2		-10.72	0.93		0.20				UW	0.01	48.9	
1750	10/28/2017 6:16	2		-11.36							U	0.03	257.9	
1751	10/28/2017 8:15	2		-9.56							C	0.02	252.6	0.02
1752	10/28/2017 8:33	2		-8.38							W	0.02	180.9	0.01
1753	10/28/2017 8:50	2		-7.61							C	0.03	213.8	0.01
1754	10/28/2017 9:07	2		-8.08							W	0.03	229.7	
1755	10/28/2017 9:24	2		-2.64							0.21UW	0.12	276.3	
1756	10/28/2017 9:42	2		-2.24				0.19			U	0.04	240.5	0.02
1757	10/28/2017 9:59	2		-1.56	0.98		0.20				UW	0.02	136.3	0.02
1758	10/28/2017 10:16	2		1.07							U	0.05	288.0	0.02
1759	10/28/2017 12:15	2		8.35							C	0.04	258.0	0.03
1760	10/28/2017 12:33	2		5.82							W	0.02	185.5	
1761	10/28/2017 12:50	2		9.95							C	0.02	267.3	
1762	10/28/2017 13:07	2		8.20							W	0.10	212.0	0.17
1763	10/28/2017 13:24	2		9.69							0.31UW	0.18	537.1	0.17
1764	10/28/2017 13:42	2		12.05				0.27			U	0.03	459.8	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1765	10/28/2017 13:59	2		6.96		6.09		0.25			UW	0.02	164.8	2.80
1766	10/28/2017 14:16	2		12.00							U	0.02	446.3	
1767	10/28/2017 16:15	2		12.38							C	0.03	296.0	
1768	10/28/2017 16:33	2		8.83							W	0.07	418.6	0.57
1769	10/28/2017 16:50	2		11.66							C		431.4	0.17
1770	10/28/2017 17:07	2		9.09							W	0.07	373.8	0.40
1771	10/28/2017 17:24	2		5.78							0.35UW	0.12	238.2	0.31
1772	10/28/2017 17:42	2		8.42				0.26			U	0.03	232.4	
1773	10/28/2017 17:59	2		5.89		8.21		0.25			UW	0.02	182.0	0.30
1774	10/28/2017 18:16	2		4.09							U	0.04	307.6	
1775	10/28/2017 20:15	2		-0.32							C	0.02	240.4	
1776	10/28/2017 20:33	2		-0.14							W		261.4	0.07
1777	10/28/2017 20:50	2		0.12							C	0.02	258.5	
1778	10/28/2017 21:07	2		0.10							W	0.03	300.8	
1779	10/28/2017 21:24	2		-2.62							0.35UW	0.07	256.6	0.07
1780	10/28/2017 21:42	2		-2.66				0.25			U	0.03	136.0	
1781	10/28/2017 21:59	2		-0.70		4.68		0.24			UW	0.03	242.6	0.02
1782	10/28/2017 22:16	2		0.32							U	0.03	303.2	0.89
1783	10/29/2017 0:15	2		1.47							C	0.01	221.1	0.12
1784	10/29/2017 0:33	2		1.19							W	0.03	216.8	0.09
1785	10/29/2017 0:50	2		1.92							C	0.02	330.2	
1786	10/29/2017 1:07	2		1.59							W	0.05	249.2	0.06
1787	10/29/2017 1:25	2		2.01							0.35UW	0.10	365.2	0.03
1788	10/29/2017 1:42	2		2.14				0.25			U	0.03	227.3	
1789	10/29/2017 1:59	2		2.08		4.92		0.24			UW	0.02	262.4	0.05
1790	10/29/2017 2:16	2		2.46							U	0.01	248.9	
1791	10/29/2017 4:15	2		-0.02							C	0.04	245.9	
1792	10/29/2017 4:33	2		-0.44							W	0.03	218.1	
1793	10/29/2017 4:50	2		-1.12							C	0.03	248.4	
1794	10/29/2017 5:07	2		-0.46							W	0.04	262.5	0.01
1795	10/29/2017 5:24	2		1.10							0.34UW	0.07	343.6	0.02
1796	10/29/2017 5:42	2		1.68				0.25			U	0.04	203.4	1.28
1797	10/29/2017 5:59	2		1.94		4.34		0.24			UW	0.02	224.8	0.02
1798	10/29/2017 6:16	2		2.76							U	0.01	250.7	
1799	10/29/2017 8:15	2		2.31							C	0.02	309.0	0.06
1800	10/29/2017 8:33	2		2.61							W	0.04	225.5	
1801	10/29/2017 8:50	2		2.89							C	0.03	292.9	
1802	10/29/2017 9:07	2		3.12							W	0.04	261.5	
1803	10/29/2017 9:24	2		3.67							0.35UW	0.06	354.0	0.01
1804	10/29/2017 9:42	2		4.64				0.25			U	0.05	407.1	0.13
1805	10/29/2017 9:59	2		4.77		5.59		0.24			UW	0.05	337.7	0.03
1806	10/29/2017 10:16	2		5.05							U	0.01	423.2	0.03

ID #	Date & Time	Run	A	Tmp S	Tmp N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1807	10/29/2017 12:15	2		6.07					C	0.03	397.6	0.22
1808	10/29/2017 12:33	2		6.17					W	0.02	249.7	
1809	10/29/2017 12:50	2		6.62					C		539.0	
1810	10/29/2017 13:07	2		6.87					W	0.05	524.2	
1811	10/29/2017 13:24	2		7.29					0.38UW	0.05	413.5	
1812	10/29/2017 13:42	2		7.57		0.29			U	0.06	483.3	0.17
1813	10/29/2017 13:59	2		7.45	7.80	0.27			UW	0.03	214.5	0.05
1814	10/29/2017 14:16	2		7.67					U	0.05	441.0	0.01
1815	10/29/2017 16:15	2		8.51					C	0.06	618.5	0.21
1816	10/29/2017 16:33	2		8.56					W	0.02	140.6	
1817	10/29/2017 16:50	2		9.14					C		566.6	
1818	10/29/2017 17:07	2		9.08					W	0.02	463.6	
1819	10/29/2017 17:24	2		8.48					0.38UW	0.09	502.8	0.01
1820	10/29/2017 17:42	2		8.34		0.29			U	0.08	662.0	0.14
1821	10/29/2017 17:59	2		7.91	8.65	0.27			UW	0.04	179.5	0.13
1822	10/29/2017 18:16	2		7.53					U		584.8	0.03
1823	10/29/2017 20:15	2		4.81					C	0.01	792.5	
1824	10/29/2017 20:33	2		4.97					W	0.02	92.0	
1825	10/29/2017 20:50	2		4.43					C	0.03	555.5	
1826	10/29/2017 21:07	2		5.00					W		416.3	
1827	10/29/2017 21:24	2		3.55					0.37UW	0.14	580.7	
1828	10/29/2017 21:42	2		3.03		0.28			U	0.05	570.3	0.07
1829	10/29/2017 21:59	2		3.24	5.95	0.26			UW	0.02	126.8	1.06
1830	10/29/2017 22:16	2		2.94					U	0.03	487.0	0.05
1831	10/30/2017 0:15	2		2.10					C	0.06	309.5	0.01
1832	10/30/2017 0:33	2		2.22					W	0.06	162.8	
1833	10/30/2017 0:50	2		1.49					C	0.03	427.4	
1834	10/30/2017 1:07	2		2.25					W	0.01	345.6	
1835	10/30/2017 1:24	2		2.41					0.37UW	0.05	397.9	
1836	10/30/2017 1:42	2		2.37		0.27			U	0.03	566.0	0.05
1837	10/30/2017 1:59	2		2.14	4.73	0.26			UW		124.8	
1838	10/30/2017 2:16	2		1.40					U	0.02	424.9	0.03
1839	10/30/2017 4:15	2		0.12					C	0.04	515.5	0.01
1840	10/30/2017 4:33	2		0.98					W	0.04	174.7	
1841	10/30/2017 4:50	2		1.01					C	0.02	399.6	
1842	10/30/2017 5:07	2		1.08					W	0.03	373.4	
1843	10/30/2017 5:24	2		1.18					0.36UW	0.03	588.6	
1844	10/30/2017 5:42	2		1.04		0.27			U	0.01	430.0	0.04
1845	10/30/2017 5:59	2		0.64	3.79	0.26			UW	0.04	95.2	0.08
1846	10/30/2017 6:16	2		-0.28					U		356.3	0.02
1847	10/30/2017 8:15	2		-0.26					C	0.02	664.4	0.02
1848	10/30/2017 8:33	2		0.04					W	0.03	41.2	

ID #	Date & Time	Run	A	Tmp S	Tmp N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1849	10/30/2017 8:50	2		0.10					C	0.01	555.6	
1850	10/30/2017 9:07	2		0.10					W	0.04	332.8	
1851	10/30/2017 9:24	2		0.28					0.35UW	0.03	495.6	
1852	10/30/2017 9:42	2		0.46		0.27			U		407.1	0.06
1853	10/30/2017 9:59	2		0.38	3.36	0.26			UW	0.02	56.1	0.34
1854	10/30/2017 10:16	2		0.70					U		507.2	0.02
1855	10/30/2017 12:15	2		1.32					C	0.01	729.8	0.02
1856	10/30/2017 12:33	2		0.67					W	0.01	27.8	
1857	10/30/2017 12:50	2		1.18					C	0.03	621.3	
1858	10/30/2017 13:07	2		0.26					W		418.2	
1859	10/30/2017 13:24	2		1.53					0.35UW	0.01	590.0	
1860	10/30/2017 13:42	2		1.47		0.27			U		482.6	0.09
1861	10/30/2017 13:59	2		1.31	4.44	0.26			UW		221.0	
1862	10/30/2017 14:16	2		0.94					U	0.02	525.0	0.04
1863	10/30/2017 16:15	2		0.65					C		833.4	
1864	10/30/2017 16:33	2		0.16					W		218.3	
1865	10/30/2017 16:50	2		0.16					C		545.2	
1866	10/30/2017 17:07	2		-0.34					W	0.01	366.0	
1867	10/30/2017 17:24	2		-0.37					0.34UW		656.4	
1868	10/30/2017 17:42	2		-0.64		0.26			U	0.03	363.6	0.08
1869	10/30/2017 17:59	2		-0.65	3.58	0.25			UW		56.1	
1870	10/30/2017 18:16	2		-0.80					U	0.01	449.2	0.04
1871	10/30/2017 20:15	2		-1.96					C	0.02	941.3	0.01
1872	10/30/2017 20:33	2		-1.96					W	0.01	52.5	
1873	10/30/2017 20:50	2		-2.32					C	0.01	566.1	
1874	10/30/2017 21:07	2		-2.79					W	0.01	289.7	
1875	10/30/2017 21:24	2		-2.05					0.33UW	0.03	519.5	
1876	10/30/2017 21:42	2		-2.67		0.25			U		454.1	0.03
1877	10/30/2017 21:59	2		-2.27	2.56	0.24			UW	0.01	56.4	0.48
1878	10/30/2017 22:16	2		-2.34					U	0.02	470.9	0.02
1879	10/31/2017 0:15	2		-5.00					C	0.06	451.4	0.01
1880	10/31/2017 0:33	2		-4.68					W	0.01	66.6	
1881	10/31/2017 0:50	2		-5.66					C	0.01	430.5	
1882	10/31/2017 1:07	2		-5.47					W	0.01	325.4	
1883	10/31/2017 1:25	2		-5.17					0.29UW	0.05	384.1	
1884	10/31/2017 1:42	2		-6.21		0.22			U	0.02	421.1	0.01
1885	10/31/2017 1:59	2		-6.32	1.74	0.22			UW		56.7	
1886	10/31/2017 2:16	2		-6.70					U	0.04	248.1	0.02
1887	10/31/2017 4:15	2		-8.26					C	0.03	217.8	0.06
1888	10/31/2017 4:33	2		-7.35					W	0.03	158.1	
1889	10/31/2017 4:50	2		-8.11					C		272.0	
1890	10/31/2017 5:07	2		-8.15					W	0.03	257.1	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1891	10/31/2017 5:24	2		-8.09							0.24UW	0.03	287.7	
1892	10/31/2017 5:42	2		-9.52				0.19			U		250.7	0.02
1893	10/31/2017 5:59	2		-9.21	0.84			0.19			UW		62.7	
1894	10/31/2017 6:16	2		-8.90							U	0.02	210.2	0.03
1895	10/31/2017 8:15	2		-9.64							C	0.04	192.5	0.09
1896	10/31/2017 8:33	2		-9.19							W	0.02	117.4	
1897	10/31/2017 8:50	2		-7.86							C	0.01	253.9	
1898	10/31/2017 9:07	2		-8.27							W	0.04	207.7	0.01
1899	10/31/2017 9:24	2		-4.63							0.20UW	0.04	321.1	
1900	10/31/2017 9:42	2		-4.05				0.18			U		291.3	
1901	10/31/2017 9:59	2		-2.82	0.63			0.19			UW		145.7	0.04
1902	10/31/2017 10:16	2		-2.31							U	0.01	292.5	0.03
1903	10/31/2017 12:15	2		3.94							C	0.05	307.2	0.46
1904	10/31/2017 12:33	2		2.81							W	0.03	265.8	
1905	10/31/2017 12:50	2		3.98							C	0.02	252.3	
1906	10/31/2017 13:07	2		2.90							W	0.07	274.2	0.30
1907	10/31/2017 13:24	2		4.25							0.25UW	0.08	485.4	0.01
1908	10/31/2017 13:42	2		3.75				0.25			U	0.02	396.0	0.44
1909	10/31/2017 13:59	2		2.15	1.83			0.24			UW	0.03	231.9	
1910	10/31/2017 14:16	2		4.18							U	0.01	383.9	0.06
1911	10/31/2017 16:15	2		4.16							C	0.01	136.8	
1912	10/31/2017 16:32	2		3.69							W	0.01	267.6	
1913	10/31/2017 16:50	2		4.35							C		96.4	
1914	10/31/2017 17:07	2		2.88							W	0.02	144.3	0.01
1915	10/31/2017 17:24	2		1.35							0.29UW	0.07	139.9	0.03
1916	10/31/2017 17:42	2		2.21				0.26			U	0.02	235.4	0.30
1917	10/31/2017 17:59	2		0.89	3.45			0.25			UW	0.03	222.0	
1918	10/31/2017 18:16	2		-0.53							U		67.3	0.06
1919	10/31/2017 20:15	2		-1.18							C	0.03	154.5	0.11
1920	10/31/2017 20:32	2		-0.74							W		200.5	
1921	10/31/2017 20:50	2		-0.62							C	0.01	89.2	
1922	10/31/2017 21:07	2		-0.64							W	0.02	116.3	
1923	10/31/2017 21:24	2		-0.38							0.28UW	0.01	155.2	
1924	10/31/2017 21:42	2		-0.20				0.25			U	0.02	184.1	0.09
1925	10/31/2017 21:59	2		-0.14	2.29			0.24			UW		247.3	
1926	10/31/2017 22:16	2		-0.19							U	0.02	175.9	0.04
1927	11/1/2017 0:15	2		-0.58							C	0.01	95.6	0.06
1928	11/1/2017 0:33	2		-0.58							W	0.02	304.8	
1929	11/1/2017 0:50	2		-0.57							C		65.2	
1930	11/1/2017 1:07	2		-0.71							W		52.6	
1931	11/1/2017 1:25	2		-0.54							0.28UW	0.03	104.1	
1932	11/1/2017 1:42	2		-0.62				0.25			U		112.3	0.04

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1933	11/1/2017 1:59	2	-0.60	2.34	0.24						UW		254.2	0.15
1934	11/1/2017 2:16	2	-0.55								U	0.02	89.5	0.02
1935	11/1/2017 4:15	2	-0.96								C	0.02	64.5	0.05
1936	11/1/2017 4:32	2	-0.93								W	0.01	314.7	
1937	11/1/2017 4:50	2	-0.88								C		69.1	
1938	11/1/2017 5:07	2	-1.01								W	0.02	82.5	
1939	11/1/2017 5:24	2	-0.79							0.28	UW		111.7	
1940	11/1/2017 5:42	2	-0.91		0.25						U		72.6	0.03
1941	11/1/2017 5:59	2	-0.90	2.25	0.24						UW	0.02	310.5	0.14
1942	11/1/2017 6:16	2	-1.22								U		68.5	0.01
1943	11/1/2017 8:15	2	-1.55								C	0.02	98.6	0.08
1944	11/1/2017 8:32	2	-1.35								W	0.02	250.0	
1945	11/1/2017 8:50	2	-1.37								C	0.01	75.9	
1946	11/1/2017 9:07	2	-1.13								W	0.03	82.9	
1947	11/1/2017 9:24	2	-1.02							0.28	UW	0.04	136.6	
1948	11/1/2017 9:42	2	-1.03		0.25						U		123.6	0.02
1949	11/1/2017 9:59	2	-0.74	2.28	0.24						UW	0.03	272.2	0.06
1950	11/1/2017 10:16	2	-0.35								U		165.5	0.02
1951	11/1/2017 12:15	2	2.86								C		75.6	0.14
1952	11/1/2017 12:32	2	2.88								W	0.02	351.6	
1953	11/1/2017 12:50	2	3.47								C		59.9	
1954	11/1/2017 13:07	2	2.83								W	0.02	81.2	
1955	11/1/2017 13:24	2	3.84							0.32	UW	0.03	184.8	0.01
1956	11/1/2017 13:42	2	4.50		0.26						U	0.05	248.7	0.34
1957	11/1/2017 13:59	2	4.62	5.08	0.25						UW	0.04	348.3	
1958	11/1/2017 14:16	2	6.58								U	0.02	247.0	0.10
1959	11/2/2017 0:28	3	3.69								C	0.02	199.2	
1960	11/2/2017 0:45	3	3.75	5.31	0.24						C	0.03	205.4	
1961	11/2/2017 1:20	3	2.68								U		726.1	0.03
1962	11/2/2017 1:37	3	3.29								UW	0.01	567.8	
1963	11/2/2017 1:55	3	2.70								U		726.1	
1964	11/2/2017 2:12	3	2.57								UW	0.02	615.8	
1965	11/2/2017 4:27	3	1.58								C	0.01	240.6	0.04
1966	11/2/2017 4:44	3	1.70	4.59	0.24						C	0.05	144.8	
1967	11/2/2017 5:19	3	2.02								U	0.06	766.8	0.14
1968	11/2/2017 5:36	3	1.93								UW	0.01	506.4	
1969	11/2/2017 5:54	3	1.83								U	0.03	537.2	
1970	11/2/2017 6:11	3	1.90								UW	0.02	720.0	1.36
1971	11/2/2017 8:27	3	1.41								C		422.3	0.04
1972	11/2/2017 8:45	3	1.47	4.38	0.24						C	0.03	158.0	
1973	11/2/2017 9:19	3	2.17								U	0.03	957.6	0.15
1974	11/2/2017 9:36	3	2.05								UW		476.6	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
1975	11/2/2017 9:54	3		2.02							U		644.1	
1976	11/2/2017 10:11	3		2.54							UW	0.04	796.5	0.27
1977	11/2/2017 12:27	3		7.70							C	0.03	533.1	0.14
1978	11/2/2017 12:44	3		6.60	6.86	0.25					C	0.01	141.7	
1979	11/2/2017 13:19	3		4.67							U	0.01	866.5	0.21
1980	11/2/2017 13:36	3		7.63							UW		649.5	
1981	11/2/2017 13:54	3		5.93							U		633.7	
1982	11/2/2017 14:11	3		5.89							UW	0.09	1160.4	
1983	11/2/2017 16:27	3		3.52							C		692.0	
1984	11/2/2017 16:45	3		2.93	6.96	0.24					C	0.04	148.0	
1985	11/2/2017 17:19	3		1.97							U	0.01	818.1	0.17
1986	11/2/2017 17:36	3		2.11							UW	0.01	707.2	
1987	11/2/2017 17:54	3		1.63							U		522.1	
1988	11/2/2017 18:11	3		1.22							UW	0.11	1691.2	
1989	11/2/2017 20:27	3		0.26							C	0.03	367.4	
1990	11/2/2017 20:45	3		0.11	4.77	0.24					C	0.01	179.4	
1991	11/2/2017 21:19	3		-0.36							U		558.4	0.21
1992	11/2/2017 21:36	3		-0.10							UW	0.05	811.0	
1993	11/2/2017 21:54	3		-0.41							U		571.4	
1994	11/2/2017 22:11	3		-0.53							UW	0.05	807.6	
1995	11/3/2017 0:15	3		-0.63							C	0.02	295.8	
1996	11/3/2017 0:33	3		-0.64	3.73	0.24					C		135.8	
1997	11/3/2017 1:07	3		-1.67							U	0.02	645.1	0.25
1998	11/3/2017 1:24	3		-0.69							UW	0.01	905.4	
1999	11/3/2017 1:42	3		-1.19							U		500.8	
2000	11/3/2017 1:59	3		-1.40							UW	0.04	836.6	
2001	11/3/2017 4:15	3		-4.44							C	0.04	341.8	
2002	11/3/2017 4:33	3		-3.71	2.51	0.23					C	0.03	131.7	
2003	11/3/2017 5:07	3		-3.00							U	0.03	466.9	0.20
2004	11/3/2017 5:24	3		-2.28							UW	0.02	819.5	
2005	11/3/2017 5:42	3		-2.77							U	0.01	451.8	
2006	11/3/2017 5:59	3		-2.22							UW		533.5	
2007	11/3/2017 8:15	3		-2.49							C	0.04	334.2	0.07
2008	11/3/2017 8:33	3		-2.36	2.32	0.23					C	0.02	166.2	
2009	11/3/2017 9:07	3		-2.22							U	0.04	567.7	0.32
2010	11/3/2017 9:24	3		-1.47							UW	0.01	742.8	
2011	11/3/2017 9:42	3		-1.74							U		416.4	0.01
2012	11/3/2017 9:59	3		-1.18							UW	0.03	587.6	
2013	11/3/2017 12:15	3		0.87							C		259.1	
2014	11/3/2017 12:33	3		1.21	3.50	0.24					C	0.02	213.0	
2015	11/3/2017 13:07	3		0.10							U	0.04	590.3	0.52
2016	11/3/2017 13:24	3		0.90							UW		849.0	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2017	11/3/2017 13:42	3	1.19				U	0.02	633.8	0.06
2018	11/3/2017 13:59	3	0.88				UW	0.02	557.6	
2019	11/3/2017 16:15	3	1.96				C	0.02	252.9	
2020	11/3/2017 16:33	3	2.00	4.46	0.24		C	0.03	237.8	
2021	11/3/2017 17:07	3	0.53				U	0.05	569.4	0.46
2022	11/3/2017 17:24	3	1.01				UW	0.03	796.4	
2023	11/3/2017 17:42	3	0.87				U	0.01	443.7	0.02
2024	11/3/2017 17:59	3	0.41				UW	0.01	709.3	
2025	11/3/2017 20:15	3	-0.37				C	0.02	543.5	
2026	11/3/2017 20:33	3	-0.49	3.49	0.24		C	0.02	253.1	
2027	11/3/2017 21:07	3	-0.69				U	0.04	548.3	0.28
2028	11/3/2017 21:24	3	-0.58				UW	0.01	718.5	
2029	11/3/2017 21:42	3	-0.74				U		900.0	
2030	11/3/2017 21:59	3	-0.67				UW	0.04	744.2	
2031	11/4/2017 0:15	3	-0.36				C	0.03	240.1	
2032	11/4/2017 0:33	3	-0.25	3.07	0.24		C	0.05	267.7	
2033	11/4/2017 1:07	3	-0.08				U	0.06	448.0	0.36
2034	11/4/2017 1:25	3	-0.03				UW		549.0	
2035	11/4/2017 1:42	3	0.08				U	0.05	519.1	0.02
2036	11/4/2017 1:59	3	0.09				UW	0.04	486.8	
2037	11/4/2017 4:15	3	0.35				C	0.01	232.0	
2038	11/4/2017 4:33	3	0.49	3.26	0.24		C	0.02	250.6	
2039	11/4/2017 5:07	3	0.31				U	0.04	424.4	0.60
2040	11/4/2017 5:24	3	0.12				UW	0.01	557.7	
2041	11/4/2017 5:42	3	0.30				U	0.03	601.4	0.05
2042	11/4/2017 5:59	3	0.25				UW	0.01	504.5	
2043	11/4/2017 8:15	3	1.34				C	0.02	160.6	
2044	11/4/2017 8:32	3	1.47	3.55	0.24		C	0.01	246.2	
2045	11/4/2017 9:07	3	2.03				U	0.04	458.9	0.83
2046	11/4/2017 9:24	3	1.86				UW	0.01	492.5	
2047	11/4/2017 9:42	3	2.17				U	0.03	481.9	0.10
2048	11/4/2017 9:59	3	2.47				UW	0.02	533.7	
2049	11/4/2017 12:15	3	4.78				C	0.04	185.3	
2050	11/4/2017 12:33	3	5.24	5.33	0.24		C	0.01	339.8	
2051	11/4/2017 13:07	3	5.05				U	0.01	401.8	1.38
2052	11/4/2017 13:24	3	5.47				UW	0.04	466.3	
2053	11/4/2017 13:42	3	5.70				U	0.05	455.0	0.20
2054	11/4/2017 13:59	3	5.80				UW	0.01	366.9	
2055	11/4/2017 16:15	3	6.58				C	0.01	111.6	
2056	11/4/2017 16:32	3	6.61	6.70	0.24		C		316.7	
2057	11/4/2017 17:07	3	6.22				U	0.03	359.6	1.25
2058	11/4/2017 17:24	3	6.47				UW	0.06	480.8	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2059	11/4/2017 17:42	3		6.35							U	0.02	465.7	0.12
2060	11/4/2017 17:59	3		5.75							UW		465.1	
2061	11/4/2017 20:15	3		4.01							C		190.9	
2062	11/4/2017 20:33	3		4.24		5.93		0.24			C	0.01	223.8	
2063	11/4/2017 21:07	3		5.28							U	0.03	494.2	3.24
2064	11/4/2017 21:24	3		4.78							UW	0.04	566.7	
2065	11/4/2017 21:42	3		4.85							U	0.01	556.5	0.27
2066	11/4/2017 21:59	3		4.66							UW	0.04	571.6	
2067	11/5/2017 0:15	3		2.90							C		536.7	
2068	11/5/2017 0:33	3		2.11		5.62		0.24			C	0.02	150.8	
2069	11/5/2017 1:07	3		1.05							U	0.06	528.6	0.28
2070	11/5/2017 1:25	3		0.65							UW		202.9	
2071	11/5/2017 1:42	3		0.11							U	0.01	238.2	
2072	11/5/2017 1:59	3		0.19							UW	0.02	279.0	
2073	11/5/2017 4:15	3		-0.23							C		144.2	0.03
2074	11/5/2017 4:33	3		-0.29		4.11		0.25			C		130.7	0.01
2075	11/5/2017 5:07	3		-0.91							U	0.04	320.1	
2076	11/5/2017 5:24	3		0.15							UW		2948.9	0.04
2077	11/5/2017 5:42	3		-0.39							U	0.01	15.9	
2078	11/5/2017 5:59	3		-0.94							UW		18.1	
2079	11/5/2017 8:15	3		-4.17							C		199.2	0.12
2080	11/5/2017 8:33	3		-4.20		3.73		0.25			C	0.02	269.4	
2081	11/5/2017 9:07	3		-3.15							U	0.02	37.3	
2082	11/5/2017 9:24	3		-2.75							UW		119.7	
2083	11/5/2017 9:42	3		-3.67							U	0.02		
2084	11/5/2017 9:59	3		-2.93							UW		17.1	
2085	11/5/2017 12:18	3		-1.77							C			0.25
2086	11/5/2017 12:35	3		-2.23		3.92		0.25			C	0.01	28.7	
2087	11/5/2017 13:10	3		-3.26							U	0.02	112.6	
2088	11/5/2017 13:27	3		-1.35							UW		335.3	
2089	11/5/2017 13:45	3		-2.03							U		16.1	
2090	11/5/2017 14:02	3		-2.19							UW		50.5	
2091	11/5/2017 16:15	3		-2.53							C		154.0	0.56
2092	11/5/2017 16:33	3		-2.90		3.78		0.26			C		130.3	
2093	11/5/2017 17:07	3		-4.70							U		86.3	
2094	11/5/2017 17:24	3		-2.81							UW		150.3	
2095	11/5/2017 17:42	3		-3.51							U		5.6	
2096	11/5/2017 17:59	3		-4.01							UW		76.5	
2097	11/5/2017 20:15	3		-10.32							C	0.02	255.8	0.90
2098	11/5/2017 20:35	3		-10.19		2.96		0.24			C		206.0	0.09
2099	11/5/2017 21:10	3		-11.13							U	0.01	283.5	
2100	11/5/2017 21:30	3		-8.70							UW		189.2	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2101	11/5/2017 21:50	3	-10.62				U	0.01		
2102	11/5/2017 22:07	3	-10.68				UW			
2103	11/6/2017 0:18	3	-11.95				C		190.3	0.93
2104	11/6/2017 0:29	3	-12.35				C	0.02	141.0	
2105	11/6/2017 0:38	3	-11.59	2.45	0.24		C		110.7	
2106	11/6/2017 0:49	3	-11.43	2.32	0.23		C	0.03	190.8	
2107	11/6/2017 1:13	3	-10.96				U		103.1	0.10
2108	11/6/2017 1:23	3	-10.85				U		316.2	0.43
2109	11/6/2017 1:43	3	-8.23				UW		40.8	0.45
2110	11/6/2017 2:01	3	-8.66				U			0.24
2111	11/6/2017 2:18	3	-8.68				UW	0.02	359.1	
2112	11/6/2017 4:28	3	-7.45				C	0.01	210.6	
2113	11/6/2017 4:48	3	-7.19	2.03	0.23		C		130.7	
2114	11/6/2017 5:23	3	-7.85				U		346.1	0.26
2115	11/6/2017 5:40	3	-5.28				UW	0.02	73.4	0.42
2116	11/6/2017 5:57	3	-6.11				U	0.01	302.9	
2117	11/6/2017 6:15	3	-6.05				UW	0.01	233.4	
2118	11/6/2017 8:28	3	-4.14				C		104.2	
2119	11/6/2017 8:48	3	-3.78	1.99	0.23		C	0.02		
2120	11/6/2017 9:23	3	-4.12				U	0.01	398.2	0.24
2121	11/6/2017 9:40	3	-2.67				UW		231.1	0.03
2122	11/6/2017 9:58	3	-2.13				U	0.01	302.6	0.08
2123	11/6/2017 10:15	3	-2.24				UW		297.4	
2124	11/6/2017 12:28	3	-1.90				C		139.1	
2125	11/6/2017 12:48	3	-1.44	2.14	0.23		C			
2126	11/6/2017 13:23	3	-1.66				U		301.6	0.10
2127	11/6/2017 13:43	3	-1.76				UW		314.8	
2128	11/6/2017 14:03	3	-1.49				U	0.03	255.0	0.07
2129	11/6/2017 14:20	3	-1.23				UW	0.02	241.6	
2130	11/6/2017 16:28	3	-2.15				C	0.02	103.4	
2131	11/6/2017 16:48	3	-1.60	2.29	0.25		C		44.8	
2132	11/6/2017 17:23	3	-2.56				U	0.03	204.3	0.01
2133	11/6/2017 17:43	3	-3.00				UW	0.03	292.6	
2134	11/6/2017 18:00	3	-2.80				U		168.9	0.10
2135	11/6/2017 18:17	3	-3.04				UW		318.5	
2136	11/6/2017 20:28	3	-3.59				C	0.02	235.5	
2137	11/6/2017 20:48	3	-2.41	2.46	0.26		C		3.0	
2138	11/6/2017 21:23	3	-3.28				U		663.9	0.02
2139	11/6/2017 21:40	3	-3.14				UW	0.02	459.7	0.08
2140	11/6/2017 22:00	3	-3.25				U	0.01	348.7	0.05
2141	11/6/2017 22:18	3	-3.29				UW	0.02	641.0	
2142	11/7/2017 0:15	3	-3.18				C	0.02	211.9	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2143	11/7/2017 0:35	3		-2.19		2.60		0.26			C	0.01	21.4	
2144	11/7/2017 1:10	3		-3.20							U	0.02	578.8	0.02
2145	11/7/2017 1:27	3		-2.93							UW	0.01	465.1	0.04
2146	11/7/2017 1:47	3		-3.01							U	0.01	351.9	0.04
2147	11/7/2017 2:05	3		-3.05							UW	0.02	598.2	
2148	11/7/2017 4:15	3		-6.22							C	0.01	229.3	
2149	11/7/2017 4:35	3		-3.56		2.68		0.26			C	0.01		0.01
2150	11/7/2017 5:10	3		-4.10							U		364.4	0.02
2151	11/7/2017 5:27	3		-3.52							UW		382.5	0.08
2152	11/7/2017 5:47	3		-3.99							U		339.8	0.04
2153	11/7/2017 6:05	3		-4.23							UW	0.02	622.4	
2154	11/7/2017 8:15	3		-4.45							C	0.04	307.7	0.01
2155	11/7/2017 8:35	3		-3.06		2.77		0.26			C	0.03	153.5	0.01
2156	11/7/2017 9:13	3		-2.32							U		490.5	0.03
2157	11/7/2017 9:33	3		0.75							UW	0.03	269.8	0.04
2158	11/7/2017 9:53	3		-0.46							U	0.03	346.1	0.05
2159	11/7/2017 10:10	3		0.09							UW	0.01	433.0	0.41
2160	11/7/2017 12:15	3		0.26							C		312.1	
2161	11/7/2017 12:32	3		-0.27		2.96		0.26			C		153.8	
2162	11/7/2017 13:07	3		-1.31							U		466.6	0.01
2163	11/7/2017 13:24	3		0.09							UW	0.01	280.1	0.05
2164	11/7/2017 13:42	3		-0.18							U	0.01	157.7	0.03
2165	11/7/2017 13:59	3		-0.54							UW		444.1	1.26
2166	11/7/2017 16:15	3		-1.70							C		266.7	
2167	11/7/2017 16:35	3		-1.85		2.86		0.26			C		140.0	
2168	11/7/2017 17:10	3		-2.25							U	0.01	521.1	0.02
2169	11/7/2017 17:27	3		-2.37							UW		331.5	0.06
2170	11/7/2017 17:45	3		-2.33							U	0.04	832.2	0.02
2171	11/7/2017 18:02	3		-2.58							UW		37.2	0.60
2172	11/7/2017 20:15	3		-2.66							C		387.2	0.01
2173	11/7/2017 20:33	3		-2.52		2.75		0.26			C		99.0	
2174	11/7/2017 21:07	3		-2.59							U		695.2	0.01
2175	11/7/2017 21:24	3		-2.61							UW	0.01	258.3	0.06
2176	11/7/2017 21:42	3		-2.60							U	0.03	969.9	0.02
2177	11/7/2017 21:59	3		-2.69							UW	0.01	119.4	0.25
2178	11/8/2017 0:15	3		-5.62							C	0.01	277.4	
2179	11/8/2017 0:36	3		-6.69		2.68		0.25			C	0.02	192.2	
2180	11/8/2017 1:10	3		-7.87							U	0.01	549.5	0.04
2181	11/8/2017 1:27	3		-9.50							UW	0.01	347.5	
2182	11/8/2017 1:45	3		-8.60							U	0.03	544.4	0.13
2183	11/8/2017 2:02	3		-9.06							UW		295.6	
2184	11/8/2017 4:15	3		-9.78							C	0.01	145.7	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2185	11/8/2017 4:33	3	-10.94	2.44	0.24		C	0.03	318.2	
2186	11/8/2017 5:07	3	-10.70				U	0.01	489.9	0.10
2187	11/8/2017 5:24	3	-12.09				UW	0.02	312.2	
2188	11/8/2017 5:42	3	-10.21				U	0.03	379.1	0.17
2189	11/8/2017 5:59	3	-11.36				UW		352.8	
2190	11/8/2017 8:15	3	-7.23				C		105.9	0.16
2191	11/8/2017 8:33	3	-5.08	2.36	0.24		C	0.02	214.1	
2192	11/8/2017 9:07	3	-3.82				U	0.01	427.1	0.01
2193	11/8/2017 9:24	3	-3.88				UW		238.2	0.19
2194	11/8/2017 9:42	3	-2.06				U	0.01	370.4	0.13
2195	11/8/2017 9:59	3	-0.42				UW		134.0	1.43
2196	11/8/2017 12:15	3	2.24				C		77.1	
2197	11/8/2017 12:33	3	1.45	2.58	0.27		C	0.01	304.6	
2198	11/8/2017 13:07	3	2.98				U	0.01	317.4	0.03
2199	11/8/2017 13:24	3	3.41				UW		88.2	
2200	11/8/2017 13:42	3	3.61				U	0.03	214.5	0.71
2201	11/8/2017 13:59	3	3.56				UW		214.4	
2202	11/8/2017 16:15	3	2.01				C	0.02	229.6	
2203	11/8/2017 16:33	3	1.13	2.74	0.32		C	0.05	180.6	
2204	11/8/2017 17:07	3	0.77				U	0.03	390.5	0.41
2205	11/8/2017 17:24	3	-0.09				UW	0.03	158.1	
2206	11/8/2017 17:42	3	-0.18				U	0.03	503.4	0.92
2207	11/8/2017 17:59	3	-0.46				UW		344.7	
2208	11/8/2017 20:15	3	-1.46				C	0.03	314.0	
2209	11/8/2017 20:33	3	-1.87	2.56	0.31		C	0.02	147.1	
2210	11/8/2017 21:07	3	-2.48				U	0.01	579.5	0.16
2211	11/8/2017 21:24	3	-2.10				UW	0.02	279.7	
2212	11/8/2017 21:42	3	-2.28				U	0.06	826.5	0.33
2213	11/8/2017 21:59	3	-2.63				UW	0.05	376.3	
2214	11/9/2017 0:15	3	-5.33				C	0.05	306.9	
2215	11/9/2017 0:33	3	-6.12	2.25	0.23		C		3.8	0.03
2216	11/9/2017 1:07	3	-5.83				U		30.2	
2217	11/9/2017 1:25	3	-4.76				UW	0.01	272.6	0.02
2218	11/9/2017 1:42	3	-5.23				U	0.04	859.0	0.18
2219	11/9/2017 1:59	3	-5.60				UW	0.03	313.8	
2220	11/9/2017 4:15	3	-6.14				C	0.03	603.1	0.08
2221	11/9/2017 4:33	3	-6.88	1.90	0.20		C			0.01
2222	11/9/2017 5:07	3	-9.08				U		1548.1	
2223	11/9/2017 5:24	3	-7.93				UW	0.01	188.5	0.01
2224	11/9/2017 5:42	3	-9.13				U			
2225	11/9/2017 5:59	3	-8.91				UW	0.02	254.7	
2226	11/9/2017 8:15	3	-8.01				C	0.05	233.6	0.01

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2227	11/9/2017 8:33	3		-8.37		1.54		0.18			C	0.03		0.02
2228	11/9/2017 9:07	3		-7.49							U	0.01	24.5	
2229	11/9/2017 9:24	3		-3.83							UW	0.04	185.2	0.08
2230	11/9/2017 9:42	3		-4.97							U			
2231	11/9/2017 9:59	3		-3.85							UW	0.03	243.9	0.38
2232	11/9/2017 12:15	3		-3.76							C	0.05	660.8	
2233	11/9/2017 12:33	3		-5.00		1.56		0.19			C		76.3	
2234	11/9/2017 13:07	3		-5.28							U	0.03	75.4	
2235	11/9/2017 13:24	3		-2.75							UW	0.02	238.2	0.12
2236	11/9/2017 13:42	3		-2.20							U	0.01		
2237	11/9/2017 13:59	3		-1.88							UW	0.02	292.8	0.02
2238	11/9/2017 16:15	3		-6.03							C	0.04	347.7	
2239	11/9/2017 16:33	3		-7.25		1.50		0.18			C	0.02	89.0	
2240	11/9/2017 17:07	3		-8.93							U	0.02	71.6	
2241	11/9/2017 17:24	3		-8.25							UW		216.6	0.03
2242	11/9/2017 17:42	3		-9.31							U		116.1	
2243	11/9/2017 17:59	3		-9.35							UW		202.9	
2244	11/9/2017 20:15	3		-13.51							C	0.03	164.7	
2245	11/9/2017 20:33	3		-13.27		1.04		0.17			C	0.03	209.3	
2246	11/9/2017 21:07	3		-13.26							U	0.02		
2247	11/9/2017 21:24	3		-12.23							UW	0.01	165.3	0.04
2248	11/9/2017 21:42	3		-13.65							U			
2249	11/9/2017 21:59	3		-12.80							UW	0.01	202.4	0.01
2250	11/10/2017 0:15	3		-9.68							C	0.02	189.0	0.07
2251	11/10/2017 0:33	3		-9.43		0.62		0.17			C	0.05	126.3	
2252	11/10/2017 1:07	3		-11.11							U		23.3	
2253	11/10/2017 1:25	3		-8.70							UW		138.8	0.06
2254	11/10/2017 1:42	3		-9.50							U			
2255	11/10/2017 1:59	3		-9.13							UW	0.02	219.5	0.02
2256	11/10/2017 4:15	3		-9.51							C		146.7	0.01
2257	11/10/2017 4:33	3		-9.20		0.19		0.17			C	0.04	195.9	
2258	11/10/2017 5:07	3		-10.07							U	0.03	18.3	
2259	11/10/2017 5:24	3		-8.93							UW	0.01	174.0	0.07
2260	11/10/2017 5:42	3		-9.52							U			
2261	11/10/2017 5:59	3		-9.18							UW	0.05	249.5	0.02
2262	11/10/2017 8:15	3		-8.80							C		72.4	0.02
2263	11/10/2017 8:33	3		-8.33		-0.15		0.17			C	0.04	276.5	
2264	11/10/2017 9:07	3		-8.65							U	0.01	39.5	
2265	11/10/2017 9:24	3		-7.79							UW		34.1	0.07
2266	11/10/2017 9:42	3		-7.92							U			
2267	11/10/2017 9:59	3		-7.46							UW		163.3	0.02
2268	11/10/2017 12:15	3		-6.39							C	0.01	29.4	0.09

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2269	11/10/2017 12:33	3		-5.79		-0.05		0.17			C	0.03	504.0	
2270	11/10/2017 13:07	3		-6.42							U			
2271	11/10/2017 13:24	3		-5.42							UW		33.4	0.08
2272	11/10/2017 13:42	3		-5.47							U			
2273	11/10/2017 13:59	3		-5.27							UW	0.01	108.3	0.02
2274	11/10/2017 16:15	3		-4.83							C		69.3	0.01
2275	11/10/2017 16:33	3		-4.74		-0.11		0.17			C	0.01	339.5	
2276	11/10/2017 17:07	3		-4.83							U	0.04	307.4	
2277	11/10/2017 17:24	3		-4.50							UW	0.01	106.2	0.09
2278	11/10/2017 17:42	3		-4.58							U			
2279	11/10/2017 17:59	3		-4.37							UW	0.02	128.4	0.13
2280	11/10/2017 20:15	3		-3.62							C	0.01	33.3	0.01
2281	11/10/2017 20:33	3		-3.50		0.01		0.17			C	0.01	269.4	
2282	11/10/2017 21:07	3		-3.35							U		18.6	
2283	11/10/2017 21:24	3		-3.08							UW	0.02	58.4	0.11
2284	11/10/2017 21:42	3		-3.13							U	0.01		
2285	11/10/2017 21:59	3		-3.03							UW	0.01	100.9	0.55
2286	11/11/2017 0:15	3		-3.68							C		72.9	0.10
2287	11/11/2017 0:33	3		-3.62		-0.10		0.17			C	0.05	236.3	
2288	11/11/2017 1:07	3		-3.76							U	0.03	3.6	
2289	11/11/2017 1:25	3		-3.63							UW		38.8	0.07
2290	11/11/2017 1:42	3		-4.22							U			
2291	11/11/2017 1:59	3		-4.19							UW	0.01	107.1	0.50
2292	11/11/2017 4:15	3		-5.37							C		71.3	0.15
2293	11/11/2017 4:33	3		-5.56		-0.33		0.17			C	0.04	215.5	
2294	11/11/2017 5:07	3		-6.19							U	0.04	8.5	
2295	11/11/2017 5:24	3		-6.31							UW		89.9	0.04
2296	11/11/2017 5:42	3		-7.25							U			
2297	11/11/2017 5:59	3		-6.71							UW	0.02	111.3	0.02
2298	11/11/2017 8:15	3		-5.70							C	0.04	74.0	0.05
2299	11/11/2017 8:32	3		-5.48		-0.48		0.17			C	0.02	170.5	
2300	11/11/2017 9:07	3		0.26							U	0.02	32.9	
2301	11/11/2017 9:24	3		1.78							UW		142.7	0.08
2302	11/11/2017 9:42	3		2.90							U	0.04	401.8	0.12
2303	11/11/2017 9:59	3		3.31							UW	0.01	232.8	
2304	11/11/2017 12:15	3		9.43							C		101.6	
2305	11/11/2017 12:33	3		5.92		1.37		0.28			C		152.3	
2306	11/11/2017 13:07	3		7.70							U	0.01	455.7	0.78
2307	11/11/2017 13:24	3		10.48							UW	0.03	556.3	0.56
2308	11/11/2017 13:42	3		10.36							U	0.03	844.1	3.40
2309	11/11/2017 13:59	3		8.83							UW	0.04	462.1	
2310	11/11/2017 16:15	3		6.90							C	0.01	196.4	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2311	11/11/2017 16:33	3		5.41		2.13		0.31			C	0.03	155.8	
2312	11/11/2017 17:07	3		1.27							U	0.02	283.4	3.07
2313	11/11/2017 17:24	3		-0.60							UW	0.05	341.1	
2314	11/11/2017 17:42	3		-1.88							U	0.02	253.3	1.37
2315	11/11/2017 17:59	3		-1.24							UW	0.01	376.7	0.11
2316	11/11/2017 20:15	3		-0.94							C		177.5	
2317	11/11/2017 20:33	3		-0.55		1.69		0.27			C	0.02	178.1	
2318	11/11/2017 21:07	3		-0.36							U	0.07	485.0	1.21
2319	11/11/2017 21:24	3		-0.21							UW	0.02	277.3	
2320	11/11/2017 21:42	3		-0.50							U	0.05	509.2	0.84
2321	11/11/2017 21:59	3		-0.40							UW	0.03	364.5	
2322	11/12/2017 0:15	3		-4.75							C	0.01	129.3	
2323	11/12/2017 0:33	3		-3.86		1.64		0.23			C	0.05	144.4	
2324	11/12/2017 1:07	3		-3.76							U	0.01	398.4	0.93
2325	11/12/2017 1:25	3		-3.68							UW	0.03	270.8	
2326	11/12/2017 1:42	3		-4.61							U	0.04	311.5	0.77
2327	11/12/2017 1:59	3		-4.27							UW	0.01	247.5	
2328	11/12/2017 4:15	3		-6.72							C	0.01	129.6	
2329	11/12/2017 4:33	3		-7.11		1.26		0.19			C	0.05	126.6	
2330	11/12/2017 5:07	3		-7.44							U	0.03	295.5	1.05
2331	11/12/2017 5:24	3		-6.73							UW	0.04	261.4	
2332	11/12/2017 5:42	3		-7.29							U	0.01	188.9	1.07
2333	11/12/2017 5:59	3		-7.06							UW	0.01	141.4	
2334	11/12/2017 8:15	3		-4.56							C	0.02	117.3	
2335	11/12/2017 8:33	3		-4.40		0.28		0.17			C	0.03	141.5	
2336	11/12/2017 9:07	3		-0.82							U	0.04	325.6	0.78
2337	11/12/2017 9:24	3		0.62							UW	0.02	210.6	
2338	11/12/2017 9:42	3		1.48							U	0.01	579.6	1.10
2339	11/12/2017 9:59	3		2.72							UW	0.04	224.8	
2340	11/12/2017 12:15	3		7.19							C		147.5	
2341	11/12/2017 12:33	3		4.17		1.61		0.28			C	0.02	159.5	
2342	11/12/2017 13:07	3		6.00							U	0.01	511.8	2.02
2343	11/12/2017 13:24	3		8.28							UW		288.1	
2344	11/12/2017 13:42	3		8.07							U	0.06	792.3	1.49
2345	11/12/2017 13:59	3		7.41							UW	0.01	424.9	
2346	11/12/2017 16:15	3		6.77							C	0.01	153.2	
2347	11/12/2017 16:33	3		4.89		2.36		0.29			C	0.02	187.9	
2348	11/12/2017 17:07	3		-1.44							U		286.2	3.25
2349	11/12/2017 17:24	3		-1.40							UW		221.9	0.06
2350	11/12/2017 17:42	3		-2.28							U	0.01	302.3	1.46
2351	11/12/2017 17:59	3		-2.69							UW		291.5	0.32
2352	11/12/2017 20:15	3		-3.31							C	0.04	135.0	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2353	11/12/2017 20:33	3		-3.88		1.67		0.24			C	0.03	199.1	
2354	11/12/2017 21:07	3		-2.99							U	0.04	493.0	4.06
2355	11/12/2017 21:24	3		-2.86							UW	0.02	274.1	
2356	11/12/2017 21:42	3		-3.09							U	0.02	318.3	1.52
2357	11/12/2017 21:59	3		-2.80							UW	0.03	368.7	
2358	11/13/2017 0:15	3		-2.94							C	0.03	166.4	
2359	11/13/2017 0:33	3		-3.44		1.56		0.20			C	0.02	165.9	
2360	11/13/2017 1:07	3		-2.98							U	0.05	347.4	2.33
2361	11/13/2017 1:25	3		-3.05							UW	0.02	216.6	
2362	11/13/2017 1:42	3		-3.33							U	0.01	297.2	1.20
2363	11/13/2017 1:59	3		-3.07							UW	0.03	220.3	
2364	11/13/2017 4:15	3		-2.03							C	0.01	119.3	
2365	11/13/2017 4:33	3		-1.94		1.25		0.18			C	0.04	178.0	
2366	11/13/2017 5:07	3		-1.10							U	0.03	294.8	0.87
2367	11/13/2017 5:24	3		-0.86							UW		135.7	
2368	11/13/2017 5:42	3		-1.16							U	0.02	216.0	0.72
2369	11/13/2017 5:59	3		-1.01							UW	0.01	172.6	
2370	11/13/2017 8:15	3		-0.02							C		99.9	
2371	11/13/2017 8:33	3		0.66		1.28		0.19			C	0.01	319.0	
2372	11/13/2017 9:07	3		2.46							U		212.4	0.49
2373	11/13/2017 9:24	3		2.08							UW		104.3	
2374	11/13/2017 9:42	3		2.97							U	0.01	239.9	0.62
2375	11/13/2017 9:59	3		2.46							UW		158.1	
2376	11/13/2017 12:15	3		9.04							C		85.3	
2377	11/13/2017 12:33	3		8.40		1.93		0.27			C	0.04	454.0	
2378	11/13/2017 13:07	3		6.76							U	0.02	456.2	1.59
2379	11/13/2017 13:24	3		7.16							UW		145.6	
2380	11/13/2017 13:42	3		7.44							U	0.05	922.7	0.50
2381	11/13/2017 13:59	3		6.77							UW	0.01	278.9	
2382	11/13/2017 16:15	3		5.10							C	0.01	77.9	
2383	11/13/2017 16:33	3		4.98		3.06		0.27			C	0.04	393.2	
2384	11/13/2017 17:07	3		5.67							U	0.04	273.6	1.56
2385	11/13/2017 17:24	3		4.45							UW	0.01	162.4	
2386	11/13/2017 17:42	3		4.40							U		273.9	0.34
2387	11/13/2017 17:59	3		4.30							UW	0.03	209.9	
2388	11/13/2017 20:15	3		0.96							C	0.02	136.3	
2389	11/13/2017 20:33	3		0.34		2.53		0.27			C	0.01	241.3	
2390	11/13/2017 21:07	3		5.09							U	0.06	249.3	1.39
2391	11/13/2017 21:24	3		3.33							UW	0.01	224.1	
2392	11/13/2017 21:42	3		3.90							U		554.8	0.43
2393	11/13/2017 21:59	3		4.25							UW	0.03	294.0	
2394	11/14/2017 0:15	3		4.91							C		118.1	

ID #	Date & Time	Run	A	Tmp S	Tmp N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2395	11/14/2017 0:33	3		4.96	4.53	0.28			C	0.02	350.2	
2396	11/14/2017 1:07	3		5.25					U	0.01	390.5	1.67
2397	11/14/2017 1:24	3		4.77					UW		326.8	
2398	11/14/2017 1:42	3		4.74					U	0.03	407.0	0.38
2399	11/14/2017 1:59	3		4.71					UW		254.7	
2400	11/14/2017 4:15	3		4.93					C		159.4	
2401	11/14/2017 4:33	3		4.93	5.26	0.29			C	0.02	296.4	
2402	11/14/2017 5:07	3		5.44					U	0.03	402.7	1.91
2403	11/14/2017 5:24	3		4.86					UW		211.4	
2404	11/14/2017 5:42	3		4.81					U	0.01	348.5	0.58
2405	11/14/2017 5:59	3		4.94					UW		272.5	
2406	11/14/2017 8:15	3		5.38					C		191.4	
2407	11/14/2017 8:33	3		5.47	5.78	0.30			C		363.8	
2408	11/14/2017 9:07	3		6.48					U	0.02	444.9	1.80
2409	11/14/2017 9:24	3		5.95					UW		194.3	
2410	11/14/2017 9:42	3		6.19					U	0.01	548.1	0.73
2411	11/14/2017 9:59	3		6.46					UW	0.03	342.7	
2412	11/14/2017 12:15	3		6.86					C		155.4	
2413	11/14/2017 12:33	3		7.06	7.02	0.31			C	0.02	467.9	
2414	11/14/2017 13:07	3		7.25					U	0.04	450.4	1.71
2415	11/14/2017 13:24	3		7.03					UW	0.02	288.8	
2416	11/14/2017 13:42	3		7.03					U	0.05	735.5	0.62
2417	11/14/2017 13:59	3		7.18					UW		305.8	
2418	11/14/2017 16:15	3		7.81					C		232.6	
2419	11/14/2017 16:33	3		7.52	7.67	0.31			C		365.9	
2420	11/14/2017 17:07	3		6.43					U	0.01	548.1	4.95
2421	11/14/2017 17:24	3		5.90					UW	0.04	282.8	
2422	11/14/2017 17:42	3		6.03					U	0.01	421.9	2.20
2423	11/14/2017 17:59	3		5.54					UW	0.01	363.5	
2424	11/14/2017 20:15	3		1.56					C	0.01	182.7	
2425	11/14/2017 20:33	3		1.98	5.33	0.30			C	0.01	297.9	
2426	11/14/2017 21:07	3		6.25					U	0.02	392.4	2.87
2427	11/14/2017 21:24	3		4.83					UW	0.01	288.6	
2428	11/14/2017 21:42	3		5.06					U	0.03	700.0	1.91
2429	11/14/2017 21:59	3		5.72					UW		453.8	
2430	11/15/2017 0:15	3		2.35					C	0.01	482.8	
2431	11/15/2017 0:33	3		2.23	5.31	0.30			C	0.01	187.5	
2432	11/15/2017 1:07	3		2.73					U	0.05	600.6	1.01
2433	11/15/2017 1:25	3		1.38					UW		228.8	
2434	11/15/2017 1:42	3		1.02					U	0.03	447.1	0.77
2435	11/15/2017 1:59	3		1.38					UW	0.04	349.3	
2436	11/15/2017 4:15	3		0.22					C	0.01	229.4	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2437	11/15/2017 4:33	3		0.34		3.42		0.30			C	0.05	173.5	
2438	11/15/2017 5:07	3		0.90							U	0.06	585.6	0.91
2439	11/15/2017 5:24	3		0.26							UW		232.1	
2440	11/15/2017 5:42	3		0.06							U	0.01	400.4	0.67
2441	11/15/2017 5:59	3		0.14							UW	0.02	313.7	
2442	11/15/2017 8:15	3		-1.61							C	0.02	715.7	
2443	11/15/2017 8:33	3		-1.75		2.83		0.29			C	0.01	105.2	
2444	11/15/2017 9:07	3		-2.41							U	0.03	748.8	0.32
2445	11/15/2017 9:24	3		-1.85							UW	0.01	381.6	
2446	11/15/2017 9:42	3		-2.40							U		811.7	0.36
2447	11/15/2017 9:59	3		-2.18							UW		379.3	
2448	5/4/2018 16:15	4		28.30		16.67		0.41			C	0.32	537.3	
2449	5/4/2018 16:32	4		25.60							W	0.22	1725.3	
2450	5/4/2018 16:48	4		28.64							C	0.70	614.0	
2451	5/4/2018 17:05	4		25.88							W	0.02	806.0	
2452	5/4/2018 17:21	4		26.40							U	0.29	1061.9	11.35
2453	5/4/2018 17:38	4		25.02		16.96					0.40UW	0.32	1711.4	45.20
2454	5/4/2018 17:54	4		24.93		11.97					0.40UW	0.20	2195.3	30.76
2455	5/4/2018 18:11	4		25.68							U	0.10	875.8	3.38
2456	5/4/2018 20:15	4		18.83		14.78		0.40			C	0.37	525.1	
2457	5/4/2018 20:32	4		17.43							W	0.09	712.3	
2458	5/4/2018 20:48	4		16.96							C	0.44	540.9	
2459	5/4/2018 21:05	4		15.42							W		249.0	
2460	5/4/2018 21:21	4		15.97							U	0.33	879.9	8.48
2461	5/4/2018 21:38	4		14.51		12.30					0.39UW	0.26	1113.9	39.90
2462	5/4/2018 21:54	4		14.60		7.09					0.39UW	0.31	1283.8	31.83
2463	5/4/2018 22:11	4		14.22							U	0.26	773.1	2.19
2464	5/5/2018 0:15	4		10.40		11.97		0.40			C	1.09	703.9	
2465	5/5/2018 0:32	4		10.47							W	0.11	581.9	
2466	5/5/2018 0:48	4		11.90							C	0.85	583.5	
2467	5/5/2018 1:05	4		10.68							W	0.03	480.2	
2468	5/5/2018 1:22	4		9.52							U	0.52	902.0	6.45
2469	5/5/2018 1:38	4		9.36		9.12					0.39UW	0.38	963.1	18.59
2470	5/5/2018 1:55	4		8.57		3.95					0.38UW	0.32	1041.0	17.53
2471	5/5/2018 2:11	4		7.46							U	0.32	813.0	3.95
2472	5/5/2018 4:15	4		5.97		9.84		0.40			C	0.73	549.6	
2473	5/5/2018 4:32	4		5.99							W	0.10	489.4	
2474	5/5/2018 4:48	4		5.77							C	0.85	671.1	
2475	5/5/2018 5:05	4		5.39							W	0.06	325.1	
2476	5/5/2018 5:21	4		5.05							U	0.48	727.4	7.95
2477	5/5/2018 5:38	4		5.49		6.71					0.38UW	0.43	794.5	15.47
2478	5/5/2018 5:55	4		5.12		1.62					0.38UW	0.25	736.0	18.97

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2479	5/5/2018 6:11	4		5.04							U	0.34	1020.5	4.69
2480	5/5/2018 8:15	4		11.64	9.10	0.40					C	0.71	530.9	
2481	5/5/2018 8:32	4		13.32							W	0.17	501.0	
2482	5/5/2018 8:48	4		14.24							C	1.47	558.7	
2483	5/5/2018 9:05	4		15.47							W	0.03	212.6	
2484	5/5/2018 9:21	4		16.99							U	0.85	1386.1	20.27
2485	5/5/2018 9:38	4		16.87	10.80					0.39	UW	0.75	1168.9	16.10
2486	5/5/2018 9:54	4		18.58	5.37					0.39	UW	0.69	1350.6	32.64
2487	5/5/2018 10:11	4		20.42							U	0.54	1397.7	5.38
2488	5/5/2018 12:15	4		27.72	14.67	0.40					C	1.43	991.6	
2489	5/5/2018 12:32	4		26.38							W	0.35	957.7	14.51
2490	5/5/2018 12:48	4		31.53							C	1.48	834.0	
2491	5/5/2018 13:05	4		30.27							W	0.07	498.1	
2492	5/5/2018 13:21	4		31.06							U	1.08	1560.6	41.34
2493	5/5/2018 13:38	4		30.44	20.20					0.38	UW	1.42	2643.8	101.07
2494	5/5/2018 13:54	4		29.30	14.31					0.38	UW	1.61	2111.1	81.31
2495	5/5/2018 14:11	4		30.90							U	0.59	1472.6	12.26
2496	5/5/2018 16:15	4		23.47	17.82	0.40					C	0.46	564.2	
2497	5/5/2018 16:32	4		18.99							W	0.16	687.0	
2498	5/5/2018 16:48	4		15.81							C	0.41	871.5	
2499	5/5/2018 17:05	4		17.11							W	0.02	302.8	
2500	5/5/2018 17:21	4		24.06							U	0.69	1886.5	12.30
2501	5/5/2018 17:38	4		23.18	17.10					0.37	UW	0.36	1046.1	16.92
2502	5/5/2018 17:54	4		21.40	11.67					0.38	UW	0.52	1315.6	15.18
2503	5/5/2018 18:11	4		21.79							U	0.24	1500.8	6.19
2504	5/5/2018 20:15	4		17.80	15.68	0.40					C	0.60	670.3	
2505	5/5/2018 20:32	4		17.24							W	0.16	684.3	
2506	5/5/2018 20:48	4		15.79							C	0.45	643.7	
2507	5/5/2018 21:05	4		13.95							W	0.05	922.7	
2508	5/5/2018 21:21	4		13.28							U	0.41	901.8	7.54
2509	5/5/2018 21:38	4		12.79	12.62					0.37	UW	0.40	857.4	14.51
2510	5/5/2018 21:54	4		12.27	7.32					0.37	UW	0.49	808.1	12.62
2511	5/5/2018 22:11	4		10.76							U	0.28	838.4	5.86
2512	5/6/2018 0:15	4		8.95	12.34	0.40					C	0.63	703.9	
2513	5/6/2018 0:32	4		9.00							W	0.08	663.6	
2514	5/6/2018 0:49	4		8.14							C	1.34	652.8	
2515	5/6/2018 1:05	4		7.75							W	2.30	1960.7	
2516	5/6/2018 1:22	4		7.42							U	0.48	777.9	7.40
2517	5/6/2018 1:38	4		7.00	9.09					0.37	UW	0.46	646.9	5.95
2518	5/6/2018 1:55	4		6.85	3.96					0.36	UW	0.43	628.7	8.83
2519	5/6/2018 2:11	4		6.27							U	0.70	933.1	3.46
2520	5/6/2018 4:15	4		10.01	10.32	0.39					C	1.76	1158.2	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2521	5/6/2018 4:32	4	9.87				W	0.13	630.2	
2522	5/6/2018 4:48	4	10.08				C	2.65	1235.5	
2523	5/6/2018 5:05	4	10.60				W	0.03	178.1	
2524	5/6/2018 5:21	4	10.51				U	2.25	1582.1	4.19
2525	5/6/2018 5:38	4	10.84	8.19			0.37UW	1.93	1656.5	1.67
2526	5/6/2018 5:54	4	10.47	2.91			0.37UW	0.55	933.0	1.43
2527	5/6/2018 6:11	4	10.12				U	0.54	1159.1	0.75
2528	5/6/2018 8:15	4	13.13	10.07	0.40		C	2.70	1299.2	
2529	5/6/2018 8:32	4	14.08				W	0.23	815.8	
2530	5/6/2018 8:48	4	15.20				C	3.11	1294.6	
2531	5/6/2018 9:05	4	15.84				W	0.04	354.8	
2532	5/6/2018 9:21	4	16.79				U	1.14	1342.4	4.63
2533	5/6/2018 9:38	4	17.36	11.47			0.37UW	0.93	1414.1	1.95
2534	5/6/2018 9:54	4	19.15	6.11			0.36UW	0.89	1211.6	5.32
2535	5/6/2018 10:11	4	20.04				U	0.50	1446.3	2.74
2536	5/6/2018 12:15	4	27.08	14.32	0.40		C	2.25	1398.2	
2537	5/6/2018 12:32	4	26.06				W	0.36	982.5	11.21
2538	5/6/2018 12:48	4	28.48				C	2.33	1352.4	2.12
2539	5/6/2018 13:05	4	26.82				W	0.03	573.7	
2540	5/6/2018 13:21	4	28.89				U	1.73	1635.8	14.49
2541	5/6/2018 13:38	4	28.41	18.82			0.36UW	1.50	2336.0	40.48
2542	5/6/2018 13:54	4	28.04	13.49			0.36UW	0.74	2052.5	34.73
2543	5/6/2018 14:11	4	29.38				U	0.53	1355.0	22.10
2544	5/6/2018 16:15	4	30.54	18.59	0.39		C	1.51	1187.7	
2545	5/6/2018 16:32	4	30.51				W	0.33	1127.7	13.57
2546	5/6/2018 16:48	4	31.61				C	1.42	1295.0	3.80
2547	5/6/2018 17:05	4	28.81				W	0.06	463.6	13.62
2548	5/6/2018 17:21	4	28.83				U	0.81	1090.2	6.27
2549	5/6/2018 17:38	4	27.81	19.69			0.34UW	0.71	1355.7	20.85
2550	5/6/2018 17:54	4	27.33	14.81			0.35UW	0.51	928.2	10.15
2551	5/6/2018 18:11	4	26.83				U	0.48	1283.7	5.59
2552	5/6/2018 20:15	4	19.76	17.04	0.38		C	0.72	819.7	
2553	5/6/2018 20:32	4	17.65				W	0.23	851.6	
2554	5/6/2018 20:48	4	15.06				C	0.63	801.4	
2555	5/6/2018 21:05	4	12.94				W		1055.1	
2556	5/6/2018 21:21	4	12.67				U	0.55	906.7	2.67
2557	5/6/2018 21:38	4	12.05	13.13			0.34UW	0.50	934.1	3.38
2558	5/6/2018 21:54	4	11.62	8.31			0.34UW	0.49	705.5	1.22
2559	5/6/2018 22:11	4	11.13				U	0.29	796.3	0.50
2560	5/7/2018 0:15	4	10.14	13.07	0.38		C	0.74	732.1	
2561	5/7/2018 0:32	4	8.83				W	0.17	727.4	
2562	5/7/2018 0:49	4	10.18				C	0.67	700.2	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2563	5/7/2018 1:05	4		8.08							W	0.03	305.2	
2564	5/7/2018 1:22	4		8.03							U	0.51	752.1	1.44
2565	5/7/2018 1:38	4		8.07	9.47					0.33	UW	0.47	915.8	1.28
2566	5/7/2018 1:55	4		7.56	4.61					0.34	UW	0.59	468.6	0.55
2567	5/7/2018 2:11	4		6.69							U	0.47	818.4	0.50
2568	5/7/2018 4:15	4		5.32	10.73	0.38					C	0.46	565.5	
2569	5/7/2018 4:32	4		5.52							W	0.15	729.6	
2570	5/7/2018 4:48	4		5.92							C	1.52	608.4	
2571	5/7/2018 5:05	4		5.19							W	0.12	183.9	
2572	5/7/2018 5:21	4		4.60							U	0.44	699.8	1.05
2573	5/7/2018 5:38	4		4.71	7.25					0.33	UW	0.44	817.4	0.62
2574	5/7/2018 5:54	4		4.62	2.37					0.34	UW	0.39	475.7	0.62
2575	5/7/2018 6:11	4		4.34							U	0.30	724.1	
2576	5/7/2018 8:15	4		11.90	9.86	0.38					C	0.74	831.9	
2577	5/7/2018 8:32	4		14.22							W	0.26	750.5	0.33
2578	5/7/2018 8:48	4		15.57							C	2.11	688.6	0.62
2579	5/7/2018 9:05	4		17.62							W	0.03	327.9	
2580	5/7/2018 9:21	4		18.95							U	0.92	1438.5	1.96
2581	5/7/2018 9:38	4		19.75	12.42					0.34	UW	0.16	731.3	1.47
2582	5/7/2018 9:54	4		22.17	6.58					0.34	UW	0.94	1265.4	1.41
2583	5/7/2018 10:11	4		23.40							U	0.29	1088.4	
2584	5/7/2018 12:15	4		29.54	15.48	0.38					C	0.34	825.8	
2585	5/7/2018 12:32	4		29.43							W	0.68	1131.2	
2586	5/7/2018 12:48	4		30.44							C	2.11	1569.4	
2587	5/7/2018 13:05	4		30.31							W	0.18	856.8	0.56
2588	5/7/2018 13:21	4		30.91							U	1.64	2050.8	2.51
2589	5/7/2018 13:38	4		30.41	20.11					0.34	UW	0.23	1057.3	4.91
2590	5/7/2018 13:54	4		30.04	13.86					0.34	UW	1.90	3058.4	2.87
2591	5/7/2018 14:11	4		31.29							U	0.31	1341.9	1.54
2592	5/7/2018 15:57	4		31.66	18.76	0.37					C	1.63	1213.9	
2593	5/7/2018 16:13	4		31.08							W	0.62	1695.1	0.10
2594	5/7/2018 16:30	4		31.43							C	2.12	1611.9	0.36
2595	5/7/2018 16:47	4		30.72							W	0.15	1725.0	0.18
2596	5/7/2018 17:03	4		29.18							U	1.81	2852.8	1.30
2597	5/7/2018 17:20	4		29.62	20.02					0.33	UW	0.11	1372.1	2.20
2598	5/7/2018 17:36	4		29.16	14.41					0.33	UW	1.86	2124.2	2.05
2599	5/7/2018 17:53	4		28.35							U	0.31	1667.8	0.96
2600	5/7/2018 19:56	4		22.82	16.55	0.36					C	0.69	760.1	
2601	5/7/2018 20:13	4		21.81							W	0.33	1156.2	0.02
2602	5/7/2018 20:29	4		20.69							C	0.61	796.4	
2603	5/7/2018 20:46	4		19.91							W	0.06	450.0	
2604	5/7/2018 21:02	4		20.07							U	0.85	1725.0	0.62

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2605	5/7/2018 21:19	4		19.69		15.17					0.32UW	1.13	1305.8	0.87
2606	5/7/2018 21:35	4		19.19		9.74					0.32UW	0.56	899.2	0.75
2607	5/7/2018 21:52	4		18.59							U	0.39	1089.7	0.15
2608	5/7/2018 23:56	4		16.96		13.98		0.36			C	1.10	1155.4	
2609	5/8/2018 0:13	4		16.70							W	0.30	1228.7	0.02
2610	5/8/2018 0:29	4		17.14		13.74		0.36			C	1.15	1048.8	
2611	5/8/2018 0:45	4		17.09							W	0.32	1295.6	0.05
2612	5/8/2018 1:02	4		17.24							C	1.30	1216.5	
2613	5/8/2018 1:18	4		17.18							W	0.58	896.8	
2614	5/8/2018 1:35	4		17.03							U	1.12	1374.8	0.38
2615	5/8/2018 1:51	4		15.42		12.40					0.31UW	0.70	683.4	0.49
2616	5/8/2018 2:08	4		13.32		7.05					0.31UW	0.44	730.4	0.13
2617	5/8/2018 2:25	4		12.69							U	0.24	944.6	
2618	5/8/2018 4:31	4		13.16		12.78		0.40			C	0.90	1384.4	
2619	5/8/2018 4:48	4		13.37							W	0.33	810.3	
2620	5/8/2018 5:04	4		13.35							C	4.26	1613.0	
2621	5/8/2018 5:21	4		13.26							W	0.16	2492.4	
2622	5/8/2018 5:37	4		13.37							U	0.54	1110.6	0.28
2623	5/8/2018 5:54	4		13.88		11.38					0.37UW	0.35	1002.4	
2624	5/8/2018 6:10	4		13.84		6.29					0.36UW	0.78	996.0	0.22
2625	5/8/2018 6:27	4		13.82							U	0.69	2273.1	1.47
2626	5/8/2018 8:28	4		14.15		12.94		0.40			C	0.13	414.3	
2627	5/8/2018 8:45	4		14.86							W	0.24	811.1	
2628	5/8/2018 9:01	4		15.96							C	2.11	1773.6	
2629	5/8/2018 9:18	4		16.03							W	0.31	798.4	
2630	5/8/2018 9:34	4		18.26							U	0.73	1825.5	0.72
2631	5/8/2018 9:51	4		19.03		14.22					0.37UW	0.16	1004.8	
2632	5/8/2018 10:07	4		19.99		9.14					0.37UW	1.25	1529.3	0.49
2633	5/8/2018 10:24	4		20.74							U	0.31	2023.0	1.71
2634	5/8/2018 12:28	4		25.94		17.38		0.40			C	0.31	1197.9	0.02
2635	5/8/2018 12:45	4		26.20							W	0.33	1285.9	
2636	5/8/2018 13:01	4		27.56							C	0.29	1404.3	0.01
2637	5/8/2018 13:18	4		27.54							W	0.05	1226.5	
2638	5/8/2018 13:34	4		27.26							U	1.04	3422.0	5.87
2639	5/8/2018 13:51	4		27.91		21.53					0.36UW	0.31	1877.1	
2640	5/8/2018 14:07	4		27.92		16.07					0.36UW	0.63	2033.9	0.48
2641	5/8/2018 14:24	4		27.25							U	0.50	2925.9	10.73
2642	5/8/2018 16:28	4		23.70		19.90		0.40			C	1.17	1672.5	
2643	5/8/2018 16:45	4		24.00							W	0.48	1820.2	
2644	5/8/2018 17:01	4		25.66							C	2.74	1837.6	
2645	5/8/2018 17:18	4		23.45		21.77					W	0.20	1699.3	
2646	5/8/2018 17:34	4		22.24							U	2.16	2355.6	2.92

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2647	5/8/2018 17:51	4		20.72		17.79					0.35UW	1.34	2334.6	
2648	5/8/2018 18:07	4		20.83		13.09					0.35UW	1.26	1901.2	0.44
2649	5/8/2018 18:24	4		22.50							U	0.59	2409.0	4.08
2650	5/8/2018 20:28	4		16.51		17.05		0.39			C	0.77	900.0	
2651	5/8/2018 20:45	4		15.80							W	0.30	1124.0	
2652	5/8/2018 21:01	4		15.73							C	0.81	1008.5	
2653	5/8/2018 21:18	4		15.47		16.33					W	0.02	571.5	
2654	5/8/2018 21:34	4		15.08							U	0.71	1295.1	1.05
2655	5/8/2018 21:51	4		14.67		14.09					0.34UW	0.48	987.0	
2656	5/8/2018 22:07	4		14.76		9.26					0.34UW	0.85	954.3	
2657	5/8/2018 22:24	4		13.89							U	0.58	2003.5	0.10
2658	5/9/2018 0:15	4		13.25		14.77		0.41			C	0.26	711.6	
2659	5/9/2018 0:32	4		12.95							W	0.20	865.9	
2660	5/9/2018 0:49	4		12.32							C	2.19	1827.5	
2661	5/9/2018 1:05	4		12.01		13.91					W	0.27	772.3	
2662	5/9/2018 1:22	4		11.72							U	0.67	1002.1	0.38
2663	5/9/2018 1:38	4		11.13		11.76					0.36UW	0.40	934.4	
2664	5/9/2018 1:55	4		11.25		6.79					0.36UW	0.57	715.5	
2665	5/9/2018 2:11	4		10.89							U	0.35	1388.7	0.81
2666	5/9/2018 4:15	4		10.78		12.82		0.40			C	0.11	641.9	
2667	5/9/2018 4:32	4		11.18							W	0.38	772.4	
2668	5/9/2018 4:48	4		11.19							C	0.26	1786.2	
2669	5/9/2018 5:05	4		11.21		12.13					W	0.12	707.8	
2670	5/9/2018 5:21	4		10.90							U	0.61	892.0	0.43
2671	5/9/2018 5:38	4		10.59		10.28					0.36UW	0.30	842.6	
2672	5/9/2018 5:54	4		10.72		5.26					0.37UW	0.50	669.7	
2673	5/9/2018 6:11	4		10.66							U	0.33	1313.6	1.26
2674	5/9/2018 8:15	4		12.44		12.39		0.41			C		407.9	
2675	5/9/2018 8:32	4		12.29							W	0.20	863.1	
2676	5/9/2018 8:48	4		12.73							C	1.68	1483.0	
2677	5/9/2018 9:05	4		13.31		12.96					W	0.01	250.0	
2678	5/9/2018 9:22	4		13.63							U	0.47	839.9	0.39
2679	5/9/2018 9:38	4		13.68		11.52					0.36UW	0.38	1020.9	
2680	5/9/2018 9:55	4		13.20		6.35					0.37UW	0.59	901.5	
2681	5/9/2018 10:11	4		12.87							U	0.33	1266.0	1.00
2682	5/9/2018 12:16	4		20.72		14.39		0.41			C	0.21	828.1	
2683	5/9/2018 12:33	4		21.04							W	0.24	1108.9	0.06
2684	5/9/2018 12:49	4		21.78							C	0.69	1219.7	0.01
2685	5/9/2018 13:06	4		21.39		18.82					W		194.9	0.01
2686	5/9/2018 13:22	4		22.09				0.30			U	0.88	1489.0	1.69
2687	5/9/2018 13:39	4		23.60		17.39					0.36UW	0.60	1374.3	
2688	5/9/2018 13:56	4		24.64		12.18					0.37UW	1.26	2392.5	0.23

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2689	5/9/2018 14:12	4		24.11							U	0.86	3204.5	7.11
2690	5/9/2018 16:16	4		21.87	17.81	0.40					C	0.21	752.2	
2691	5/9/2018 16:33	4		16.79							W	0.30	1130.3	
2692	5/9/2018 16:49	4		15.09							C	0.87	909.5	
2693	5/9/2018 17:06	4		16.86	18.16						W	0.08	529.9	0.01
2694	5/9/2018 17:22	4		19.79		0.33					U	1.00	794.4	0.93
2695	5/9/2018 17:39	4		18.93	16.92					0.37	UW	0.44	765.8	
2696	5/9/2018 17:56	4		18.39	11.78					0.39	UW	0.60	623.4	
2697	5/9/2018 18:12	4		20.91							U	0.36	1296.3	1.82
2698	5/9/2018 20:16	4		16.38	16.52	0.41					C	0.18	745.3	
2699	5/9/2018 20:33	4		16.21							W	0.15	870.5	
2700	5/9/2018 20:49	4		15.94							C	1.07	1173.0	
2701	5/9/2018 21:06	4		15.24	16.14						W		229.9	
2702	5/9/2018 21:22	4		14.37		0.33					U	0.67	985.3	0.62
2703	5/9/2018 21:39	4		13.74	13.69					0.37	UW	0.51	943.3	
2704	5/9/2018 21:55	4		13.50	8.48					0.38	UW	0.71	992.4	
2705	5/9/2018 22:12	4		12.99							U	0.35	1379.4	0.91
2706	5/10/2018 0:15	4		11.20	13.85	0.41					C	0.42	878.9	
2707	5/10/2018 0:32	4		10.59							W	0.22	1096.3	
2708	5/10/2018 0:49	4		10.07							C	2.19	1676.7	
2709	5/10/2018 1:05	4		9.55	12.14						W		267.2	
2710	5/10/2018 1:22	4		9.12		0.33					U	0.85	1409.1	0.21
2711	5/10/2018 1:38	4		8.71	10.04					0.37	UW	0.55	1059.2	
2712	5/10/2018 1:55	4		8.40	4.99					0.37	UW	0.61	968.0	
2713	5/10/2018 2:11	4		7.68							U	0.30	1206.0	9.51
2714	5/10/2018 4:15	4		6.22	10.44	0.41					C	1.60	1471.3	
2715	5/10/2018 4:32	4		6.24							W	0.26	1150.5	
2716	5/10/2018 4:48	4		6.02							C	2.11	1402.4	
2717	5/10/2018 5:05	4		5.64	8.12						W	0.03	342.8	
2718	5/10/2018 5:21	4		5.15		0.32					U	1.43	1582.6	0.09
2719	5/10/2018 5:38	4		5.09	6.41					0.36	UW	0.61	1127.7	
2720	5/10/2018 5:54	4		4.95	1.58					0.37	UW	0.91	1591.4	
2721	5/10/2018 6:11	4		4.33							U	0.55	1494.9	4.77
2722	5/10/2018 8:15	4		6.14	8.32	0.41					C	1.19	1091.8	0.01
2723	5/10/2018 8:32	4		7.11							W	0.27	1241.8	
2724	5/10/2018 8:48	4		7.48							C	1.53	1576.7	
2725	5/10/2018 9:05	4		7.52	8.75						W	0.01	163.9	
2726	5/10/2018 9:21	4		8.51		0.32					U	0.84	1420.0	0.12
2727	5/10/2018 9:38	4		8.75	7.70					0.36	UW	1.35	1614.1	0.39
2728	5/10/2018 9:55	4		10.09	3.05					0.37	UW	0.61	1015.5	0.04
2729	5/10/2018 10:11	4		10.69							U	0.92	1961.0	7.20
2730	5/10/2018 12:15	4		15.75	11.79	0.41					C	0.58	1200.8	

ID #	Date & Time	Run	A	Tmp S	Tmp N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2731	5/10/2018 12:32	4		14.16					W	0.23	1185.8	
2732	5/10/2018 12:48	4		13.33					C	1.38	1224.3	
2733	5/10/2018 13:05	4		11.50	12.86				W		534.4	
2734	5/10/2018 13:21	4		10.70		0.32			U	1.05	1410.8	0.57
2735	5/10/2018 13:38	4		11.18	10.13				0.35UW	0.62	1679.5	
2736	5/10/2018 13:54	4		11.35	5.23				0.36UW	0.78	1025.6	
2737	5/10/2018 14:11	4		10.96					U	0.48	1393.8	0.63
2738	5/10/2018 16:15	4		8.27	10.62	0.40			C	0.50	1074.5	
2739	5/10/2018 16:32	4		7.97					W	0.31	1191.5	
2740	5/10/2018 16:48	4		8.05					C	2.40	1214.0	
2741	5/10/2018 17:05	4		8.47	9.93				W	0.14	660.2	
2742	5/10/2018 17:21	4		8.84		0.32			U	0.75	818.0	0.12
2743	5/10/2018 17:38	4		8.63	8.28				0.35UW	0.51	981.4	
2744	5/10/2018 17:54	4		7.98	3.23				0.37UW	0.64	680.5	
2745	5/10/2018 18:11	4		8.00					U	0.32	594.1	0.35
2746	5/10/2018 20:15	4		7.96	9.66	0.41			C	0.69	1076.3	
2747	5/10/2018 20:32	4		7.72					W	0.22	921.2	
2748	5/10/2018 20:48	4		7.52					C	3.07	1948.9	
2749	5/10/2018 21:05	4		7.28	8.54				W	0.19	570.3	
2750	5/10/2018 21:21	4		7.26		0.33			U	1.08	825.5	0.07
2751	5/10/2018 21:38	4		7.03	6.83				0.36UW	0.56	1176.5	
2752	5/10/2018 21:55	4		6.82	1.90				0.37UW	0.49	666.1	
2753	5/10/2018 22:11	4		6.46					U	0.24	746.6	0.02
2754	5/11/2018 0:15	4		6.54	8.61	0.41			C	0.32	590.8	
2755	5/11/2018 0:32	4		6.53					W	0.21	748.8	
2756	5/11/2018 0:48	4		6.59					C	1.16	1395.7	
2757	5/11/2018 1:05	4		6.49	7.73				W	0.17	369.5	
2758	5/11/2018 1:22	4		6.42		0.31			U	0.46	464.0	0.03
2759	5/11/2018 1:38	4		6.51	6.20				0.37UW	0.25	317.0	0.22
2760	5/11/2018 1:55	4		6.31	1.22				0.39UW	0.31	151.3	
2761	5/11/2018 2:11	4		5.96					U	0.22	394.2	0.04
2762	5/11/2018 4:18	4		5.99	7.85	0.42			C	0.15	258.0	
2763	5/11/2018 4:35	4		6.03					W	0.10	418.5	
2764	5/11/2018 4:51	4		6.14					C	4.49	2197.4	
2765	5/11/2018 5:08	4		6.05	6.99				W	0.28	702.2	
2766	5/11/2018 5:24	4		6.02		0.37			U	0.37	604.8	0.02
2767	5/11/2018 5:41	4		6.10	5.45				0.39UW	0.15	226.4	0.05
2768	5/11/2018 5:57	4		6.05	0.57				0.39UW	0.32	370.2	
2769	5/11/2018 6:14	4		5.93					U	0.20	691.7	0.06
2770	5/11/2018 8:15	4		6.65	7.64	0.42			C	0.13	222.6	
2771	5/11/2018 8:32	4		6.78					W	0.13	361.5	
2772	5/11/2018 8:48	4		7.00					C	4.14	2078.8	

ID #	Date & Time	Run A	Tmp S	Tmp N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2773	5/11/2018 9:05	4	7.23	7.48				W	0.21	1438.5	
2774	5/11/2018 9:22	4	7.62		0.35			U	0.60	822.3	0.01
2775	5/11/2018 9:38	4	8.07	6.31				0.40UW	0.33	437.5	0.01
2776	5/11/2018 9:55	4	9.34	1.59				0.40UW	0.58	1120.9	0.02
2777	5/11/2018 10:11	4	10.25					U	0.22	795.0	0.10
2778	5/11/2018 12:15	4	8.71	8.88	0.42			C	0.27	439.1	
2779	5/11/2018 12:32	4	8.47					W	0.16	614.3	
2780	5/11/2018 12:48	4	8.73					C	3.97	2019.5	
2781	5/11/2018 13:05	4	8.58	9.03				W	0.16	751.0	
2782	5/11/2018 13:21	4	8.41		0.35			U	0.59	985.3	0.02
2783	5/11/2018 13:38	4	8.71	7.40				0.40UW	0.81	705.4	0.01
2784	5/11/2018 13:54	4	9.08	2.36				0.40UW	0.55	612.9	
2785	5/11/2018 14:11	4	9.35					U	0.41	1071.6	0.10
2786	5/11/2018 16:15	4	10.61	9.79	0.42			C		176.6	
2787	5/11/2018 16:32	4	10.36					W	0.26	820.8	
2788	5/11/2018 16:48	4	10.57					C	3.11	2133.8	
2789	5/11/2018 17:05	4	9.95	10.34				W	0.09	783.1	
2790	5/11/2018 17:22	4	9.66		0.37			U	0.64	816.6	0.03
2791	5/11/2018 17:38	4	9.60	8.39				0.39UW	0.10	452.4	0.22
2792	5/11/2018 17:55	4	9.22	3.10				0.40UW	0.51	739.4	
2793	5/11/2018 18:11	4	9.12					U	0.33	1014.6	0.11
2794	5/11/2018 20:15	4	8.43	9.38	0.42			C	0.04	470.2	
2795	5/11/2018 20:32	4	8.17					W	0.12	552.4	
2796	5/11/2018 20:48	4	8.01					C	0.78	926.2	
2797	5/11/2018 21:05	4	7.78	8.72				W	0.19	943.2	
2798	5/11/2018 21:22	4	7.73		0.37			U	0.73	979.0	0.02
2799	5/11/2018 21:38	4	7.88	7.03				0.39UW	0.21	416.5	0.10
2800	5/11/2018 21:55	4	7.80	1.95				0.39UW	0.36	559.9	
2801	5/11/2018 22:11	4	7.64					U	0.27	931.3	0.06
2802	5/12/2018 0:15	4	7.76	8.57	0.42			C	0.13	368.0	
2803	5/12/2018 0:32	4	7.64					W	0.12	528.4	
2804	5/12/2018 0:49	4	7.49					C	1.87	1870.9	
2805	5/12/2018 1:05	4	7.25	7.98				W			
2806	5/12/2018 1:22	4	7.12		0.34			U	0.47	642.6	0.03
2807	5/12/2018 1:38	4	7.16	6.27				0.40UW	0.42	497.4	0.04
2808	5/12/2018 1:55	4	6.95	1.19				0.40UW	0.42	392.4	
2809	5/12/2018 2:11	4	6.80					U	0.24	790.1	0.06
2810	5/12/2018 4:15	4	6.97	7.97	0.42			C	0.05	434.9	
2811	5/12/2018 4:32	4	6.44					W	0.17	518.8	
2812	5/12/2018 4:48	4	6.19					C	3.54	2229.9	
2813	5/12/2018 5:05	4	5.98	7.11				W	0.21	578.5	
2814	5/12/2018 5:21	4	5.81		0.36			U	0.43	676.0	0.02

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2815	5/12/2018 5:38	4		6.28		5.44					0.39UW	0.18	464.8	0.01
2816	5/12/2018 5:55	4		6.66		0.54					0.40UW	0.32	426.5	
2817	5/12/2018 6:11	4		6.72							U	0.21	727.0	0.08
2818	5/12/2018 8:15	4		8.27		7.85		0.42			C	0.12	548.7	0.01
2819	5/12/2018 8:32	4		8.71							W	0.14	468.9	
2820	5/12/2018 8:48	4		9.07							C	0.74	831.6	
2821	5/12/2018 9:05	4		8.95		8.46					W	0.13	730.2	
2822	5/12/2018 9:21	4		9.07				0.36			U	0.57	1057.8	0.05
2823	5/12/2018 9:38	4		9.27		7.01					0.39UW	0.14	470.6	0.02
2824	5/12/2018 9:54	4		9.04		1.89					0.39UW	0.68	1267.0	
2825	5/12/2018 10:11	4		9.20							U	0.20	708.3	0.14
2826	5/12/2018 12:15	4		10.57		9.05		0.42			C	0.07	325.0	
2827	5/12/2018 12:32	4		10.69							W	0.15	554.1	
2828	5/12/2018 12:48	4		10.87							C	0.76	735.6	
2829	5/12/2018 13:05	4		10.80		10.03					W	0.10	623.3	
2830	5/12/2018 13:21	4		11.07				0.36			U	0.70	868.7	0.11
2831	5/12/2018 13:38	4		11.71		8.49					0.39UW	0.19	613.6	0.06
2832	5/12/2018 13:55	4		11.74		3.41					0.39UW	0.77	1211.4	0.28
2833	5/12/2018 14:11	4		12.07							U	0.37	1025.6	0.47
2834	5/12/2018 16:15	4		13.50		10.46		0.42			C	0.33	696.1	
2835	5/12/2018 16:35	4		14.73							W	0.17	657.6	
2836	5/12/2018 16:51	4		15.20							C	0.35	925.4	
2837	5/12/2018 17:08	4		15.04		12.32					W	0.05	548.8	
2838	5/12/2018 17:24	4		15.79				0.36			U	0.47	916.4	0.26
2839	5/12/2018 17:41	4		16.68		10.92					0.39UW	0.22	613.6	0.05
2840	5/12/2018 17:57	4		16.29		5.92					0.39UW	0.43	827.0	
2841	5/12/2018 18:14	4		14.27							U	0.30	1096.8	0.85
2842	5/12/2018 20:15	4		11.31		11.10		0.42			C	0.95	903.8	
2843	5/12/2018 20:32	4		11.02							W	0.15	698.6	
2844	5/12/2018 20:48	4		10.89							C	0.76	721.3	
2845	5/12/2018 21:05	4		10.38		10.37					W		269.5	0.02
2846	5/12/2018 21:21	4		10.41				0.36			U	0.53	801.2	0.09
2847	5/12/2018 21:38	4		10.53		8.58					0.38UW	0.49	774.7	
2848	5/12/2018 21:55	4		10.45		3.54					0.38UW	0.43	625.5	
2849	5/12/2018 22:11	4		10.19							U	0.32	975.6	0.22
2850	5/13/2018 0:15	4		10.05		9.96		0.42			C	0.15	552.5	
2851	5/13/2018 0:32	4		9.95							W	0.13	599.4	
2852	5/13/2018 0:48	4		9.90							C	0.32	596.5	
2853	5/13/2018 1:05	4		9.67		9.68					W	0.05	304.1	0.01
2854	5/13/2018 1:21	4		9.71				0.35			U	0.54	640.4	0.12
2855	5/13/2018 1:38	4		9.85		8.00					0.38UW	0.31	623.2	
2856	5/13/2018 1:54	4		9.72		2.93					0.38UW	0.76	496.8	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2857	5/13/2018 2:11	4		9.60							U	0.33	877.4	0.16
2858	5/13/2018 4:15	4		9.65	9.57	0.42					C	0.17	466.9	
2859	5/13/2018 4:32	4		9.62							W	0.17	565.6	
2860	5/13/2018 4:48	4		9.58							C	0.34	599.5	
2861	5/13/2018 5:05	4		9.41	9.37						W	0.05	219.7	
2862	5/13/2018 5:21	4		9.40		0.35					U	0.54	621.6	0.13
2863	5/13/2018 5:38	4		9.53	7.69					0.38	UW	0.25	567.5	
2864	5/13/2018 5:55	4		9.48	2.65					0.38	UW	0.42	457.8	
2865	5/13/2018 6:11	4		9.40							U	0.52	911.2	0.28
2866	5/13/2018 8:15	4		10.93	9.62	0.42					C	0.15	445.4	
2867	5/13/2018 8:32	4		10.98							W	0.13	567.8	
2868	5/13/2018 8:48	4		11.21							C	0.36	599.3	
2869	5/13/2018 9:05	4		11.66	10.34						W		396.6	
2870	5/13/2018 9:21	4		12.45		0.35					U	0.73	792.9	0.16
2871	5/13/2018 9:38	4		13.46	9.27					0.38	UW	0.24	827.7	0.02
2872	5/13/2018 9:55	4		12.94	4.17					0.38	UW	0.47	656.6	
2873	5/13/2018 10:11	4		13.56							U	0.42	1346.0	1.10
2874	5/13/2018 12:15	4		19.92	13.35	0.42					C	0.29	884.2	
2875	5/13/2018 12:32	4		18.78							W	0.55	908.3	
2876	5/13/2018 12:48	4		18.42							C	0.30	861.5	
2877	5/13/2018 13:05	4		17.40	16.09						W	0.07	391.0	
2878	5/13/2018 13:21	4		17.30		0.35					U	1.27	1100.3	0.57
2879	5/13/2018 13:38	4		18.13	14.01					0.38	UW	0.81	992.7	
2880	5/13/2018 13:54	4		18.03	8.71					0.38	UW	0.79	948.1	
2881	5/13/2018 14:11	4		18.01							U	0.68	1312.5	0.72
2882	5/13/2018 16:15	4		27.11	16.93	0.42					C	0.22	1053.2	
2883	5/13/2018 16:32	4		25.52							W	0.36	1242.8	
2884	5/13/2018 16:48	4		26.03							C	0.25	1194.7	
2885	5/13/2018 17:05	4		22.39	20.97						W	0.02	584.1	
2886	5/13/2018 17:21	4		22.73		0.35					U	2.08	1288.4	1.14
2887	5/13/2018 17:38	4		22.36	18.09					0.37	UW	1.22	1419.5	
2888	5/13/2018 17:54	4		23.84	13.43					0.38	UW	0.34	1039.3	
2889	5/13/2018 18:11	4		23.28							U	1.07	1605.1	1.64
2890	5/13/2018 20:15	4		18.64	16.74	0.41					C	0.26	870.2	
2891	5/13/2018 20:32	4		17.05							W	0.18	959.2	
2892	5/13/2018 20:48	4		16.74							C	0.23	816.9	
2893	5/13/2018 21:05	4		16.03	16.53						W	0.07	749.0	
2894	5/13/2018 21:21	4		15.94		0.35					U	1.01	897.1	0.32
2895	5/13/2018 21:38	4		15.80	14.04					0.37	UW	0.78	970.9	
2896	5/13/2018 21:54	4		15.65	9.10					0.37	UW	0.88	731.6	
2897	5/13/2018 22:11	4		15.25							U	0.58	1159.0	0.17
2898	5/14/2018 0:15	4		14.27	14.34	0.41					C	0.20	807.1	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2899	5/14/2018 0:32	4		14.06							W	0.17	838.4	
2900	5/14/2018 0:49	4		14.04							C	0.30	859.4	
2901	5/14/2018 1:05	4		13.56	14.17						W	0.14	764.5	
2902	5/14/2018 1:22	4		13.57				0.34			U	0.98	857.9	0.22
2903	5/14/2018 1:38	4		13.54	12.14					0.37	UW	0.53	930.6	
2904	5/14/2018 1:55	4		13.41	7.07					0.37	UW	0.77	714.1	
2905	5/14/2018 2:11	4		13.08							U	0.54	1155.9	0.12
2906	5/14/2018 4:15	4		10.03	12.58			0.41			C	0.09	692.9	
2907	5/14/2018 4:32	4		9.56							W	0.17	748.7	
2908	5/14/2018 4:48	4		10.09							C	0.20	1186.6	
2909	5/14/2018 5:05	4		9.52	11.58						W	0.01	1643.4	
2910	5/14/2018 5:21	4		9.44				0.34			U	1.41	783.8	0.06
2911	5/14/2018 5:38	4		10.03	9.76					0.36	UW	0.45	730.5	
2912	5/14/2018 5:54	4		10.60	4.86					0.37	UW	0.69	563.9	
2913	5/14/2018 6:11	4		10.89							U	0.44	1098.6	0.08
2914	5/14/2018 8:15	4		13.41	12.09			0.41			C	0.35	839.3	
2915	5/14/2018 8:32	4		13.77							W	0.23	865.7	
2916	5/14/2018 8:48	4		14.73							C	0.44	978.4	0.01
2917	5/14/2018 9:05	4		15.42	13.45						W	0.02	314.4	
2918	5/14/2018 9:21	4		16.78				0.34			U	1.10	1112.2	0.17
2919	5/14/2018 9:38	4		17.50	12.61					0.37	UW	0.27	1125.4	0.20
2920	5/14/2018 9:54	4		18.41	7.56					0.37	UW	0.97	854.7	0.16
2921	5/14/2018 10:11	4		17.93							U	0.69	1434.5	0.41
2922	5/14/2018 12:15	4		20.34	15.45			0.41			C	0.17	780.1	
2923	5/14/2018 12:32	4		19.45							W	0.18	930.3	
2924	5/14/2018 12:48	4		20.79							C	0.24	952.6	
2925	5/14/2018 13:05	4		21.05	17.93						W	0.03	299.0	0.02
2926	5/14/2018 13:22	4		19.82				0.34			U	1.34	1083.7	0.33
2927	5/14/2018 13:38	4		18.52	15.66					0.36	UW	0.78	1035.5	
2928	5/14/2018 13:55	4		19.20	10.31					0.37	UW	1.14	887.0	
2929	5/14/2018 14:11	4		20.24							U	0.83	1434.9	0.42
2930	5/14/2018 16:15	4		18.77	16.16			0.41			C	0.25	954.6	
2931	5/14/2018 16:32	4		18.82							W	0.15	1025.4	
2932	5/14/2018 16:48	4		18.44							C	0.38	1222.5	
2933	5/14/2018 17:05	4		18.19	17.53						W	0.06	538.8	
2934	5/14/2018 17:21	4		19.58				0.34			U	1.20	1273.2	0.14
2935	5/14/2018 17:38	4		20.12	16.05					0.36	UW	1.35	1319.0	0.07
2936	5/14/2018 17:54	4		20.28	10.99					0.37	UW	1.16	928.1	
2937	5/14/2018 18:11	4		19.93							U	0.94	1564.1	0.35
2938	5/14/2018 20:15	4		18.19	16.39			0.41			C	0.33	1061.3	
2939	5/14/2018 20:32	4		16.15							W	0.16	1075.2	
2940	5/14/2018 20:48	4		15.15							C	0.30	1187.9	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2941	5/14/2018 21:05	4	13.64	15.83							W	1.98	2294.2	
2942	5/14/2018 21:21	4	13.16					0.34			U	1.17	986.6	0.06
2943	5/14/2018 21:38	4	12.85	13.25							0.36UW	0.68	1025.5	
2944	5/14/2018 21:54	4	12.56	8.24							0.36UW	0.69	668.3	
2945	5/14/2018 22:11	4	11.83								U	0.60	1226.6	
2946	5/15/2018 0:15	4	10.39	13.44				0.41			C	0.25	715.4	
2947	5/15/2018 0:32	4	10.48								W	0.15	824.8	
2948	5/15/2018 0:48	4	10.57								C	0.31	887.9	
2949	5/15/2018 1:05	4	10.00	12.37							W	0.15	755.2	
2950	5/15/2018 1:21	4	9.56					0.33			U	0.84	869.6	0.02
2951	5/15/2018 1:38	4	9.76	10.41							0.36UW	0.49	872.8	0.18
2952	5/15/2018 1:55	4	9.53	5.42							0.36UW	0.59	730.2	
2953	5/15/2018 2:11	4	9.35								U	0.49	1164.7	
2954	5/15/2018 4:15	4	11.09	12.08				0.41			C	0.37	894.7	
2955	5/15/2018 4:32	4	11.78								W	0.20	826.0	
2956	5/15/2018 4:48	4	12.41								C	0.40	1084.3	
2957	5/15/2018 5:05	4	12.74	12.03							W	0.07	530.1	
2958	5/15/2018 5:21	4	12.49					0.33			U	1.62	1379.6	0.01
2959	5/15/2018 5:38	4	12.07	10.25							0.36UW	0.74	1398.5	0.08
2960	5/15/2018 5:54	4	11.94	5.14							0.36UW	0.65	799.0	
2961	5/15/2018 6:11	4	11.11								U	0.51	1240.7	
2962	5/15/2018 8:15	4	13.32	11.90				0.41			C	0.39	1061.7	0.01
2963	5/15/2018 8:32	4	14.57								W	0.14	880.5	
2964	5/15/2018 8:48	4	15.12								C	0.46	965.2	
2965	5/15/2018 9:05	4	15.98	14.04							W	0.01	760.1	
2966	5/15/2018 9:22	4	16.48					0.33			U	0.68	1439.0	0.05
2967	5/15/2018 9:38	4	17.41	12.90							0.36UW	0.29	1482.9	0.06
2968	5/15/2018 9:55	4	19.45	7.48							0.36UW	0.81	885.3	0.02
2969	5/15/2018 10:11	4	19.66								U	0.60	1484.8	0.30
2970	5/15/2018 12:15	4	25.54	16.73				0.41			C	1.51	1413.1	
2971	5/15/2018 12:32	4	25.39								W	0.21	1978.2	
2972	5/15/2018 12:48	4	27.16								C	0.41	1391.8	
2973	5/15/2018 13:05	4	26.62	21.70							W	0.02	1725.2	
2974	5/15/2018 13:21	4	27.47					0.34			U	2.03	3475.0	0.99
2975	5/15/2018 13:38	4	27.49	20.43							0.39UW	2.28	1724.8	0.37
2976	5/15/2018 13:54	4	27.37	15.59							0.39UW	4.09	2712.3	
2977	5/15/2018 14:11	4	28.35								U	1.34	2294.6	1.90
2978	5/15/2018 16:15	4	30.18	21.58				0.40			C	0.44	1453.9	
2979	5/15/2018 16:32	4	28.48								W	0.25	1797.7	
2980	5/15/2018 16:48	4	30.41								C	0.33	1369.7	
2981	5/15/2018 17:05	4	28.71	24.68							W	0.02	1094.6	
2982	5/15/2018 17:21	4	29.06					0.33			U	1.51	2583.6	2.05

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
2983	5/15/2018 17:38	4		27.96		21.41					0.37UW	1.98	1670.9	0.20
2984	5/15/2018 17:54	4		27.39		16.90					0.38UW	1.31	1473.9	
2985	5/15/2018 18:11	4		27.35							U	0.60	1608.9	1.72
2986	5/15/2018 20:15	4		21.47		19.10		0.39			C	0.39	1205.5	
2987	5/15/2018 20:32	4		18.75							W	0.16	1143.4	
2988	5/15/2018 20:48	4		18.34							C	0.26	994.9	
2989	5/15/2018 21:05	4		16.00		18.25					W	0.03	1180.9	
2990	5/15/2018 21:21	4		15.39				0.32			U	0.73	1422.3	0.44
2991	5/15/2018 21:38	4		14.97		15.15					0.36UW	0.64	1104.0	
2992	5/15/2018 21:55	4		14.36		10.62					0.37UW	0.71	911.2	
2993	5/15/2018 22:11	4		13.64							U	0.39	1329.8	
2994	5/16/2018 0:15	4		11.82		15.28		0.39			C	0.25	852.1	
2995	5/16/2018 0:32	4		11.18							W	0.11	875.8	
2996	5/16/2018 0:49	4		11.21							C	0.28	839.6	
2997	5/16/2018 1:05	4		10.88		14.19					W			
2998	5/16/2018 1:22	4		10.82				0.32			U	0.57	1365.1	0.12
2999	5/16/2018 1:38	4		10.99		11.98					0.36UW	0.42	1005.8	
3000	5/16/2018 1:55	4		10.76		7.25					0.36UW	0.58	639.2	
3001	5/16/2018 2:11	4		9.92							U	0.36	1059.3	0.20
3002	5/16/2018 4:15	4		9.32		13.10		0.39			C	0.26	677.9	
3003	5/16/2018 4:32	4		9.55							W	0.13	864.0	
3004	5/16/2018 4:48	4		9.21							C	0.26	747.9	
3005	5/16/2018 5:05	4		9.01		12.07					W	0.02		
3006	5/16/2018 5:21	4		8.83				0.31			U	0.51	962.5	0.05
3007	5/16/2018 5:38	4		9.19		10.07					0.36UW	0.38	822.9	0.12
3008	5/16/2018 5:54	4		9.33		5.28					0.36UW	0.49	588.0	
3009	5/16/2018 6:11	4		9.18							U	0.33	1301.7	0.02
3010	5/16/2018 8:15	4		14.64		12.66		0.39			C	0.37	1063.6	0.03
3011	5/16/2018 8:32	4		16.65							W	0.13	892.8	0.01
3012	5/16/2018 8:48	4		17.69							C	0.27	930.8	0.04
3013	5/16/2018 9:05	4		19.22		16.38					W	0.04	541.8	
3014	5/16/2018 9:21	4		20.01				0.31			U	0.85	1639.8	0.15
3015	5/16/2018 9:38	4		20.76		15.38					0.36UW	0.34	778.9	0.11
3016	5/16/2018 9:54	4		22.97		9.81					0.37UW	0.35	1437.1	0.01
3017	5/16/2018 10:11	4		23.86							U	0.69	1490.6	6.17
3018	5/16/2018 12:15	4		30.05		19.05		0.39			C	0.20	977.8	
3019	5/16/2018 12:32	4		29.51							W	0.11	1280.3	0.02
3020	5/16/2018 12:48	4		31.11							C	0.21	1141.6	
3021	5/16/2018 13:05	4		31.45		25.56					W	0.06	907.8	
3022	5/16/2018 13:21	4		32.19				0.32			U	1.36	2169.9	1.04
3023	5/16/2018 13:38	4		31.61		24.63					0.36UW	1.05	1468.8	
3024	5/16/2018 13:54	4		31.54		18.02					0.36UW	0.85	1456.5	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3025	5/16/2018 14:11	4		32.90							U	0.56	1356.5	0.97
3026	5/16/2018 16:15	4		34.02	23.53	0.39					C	0.27	1179.4	
3027	5/16/2018 16:32	4		32.73							W	0.27	1594.6	0.22
3028	5/16/2018 16:48	4		33.45							C	0.15	1213.9	
3029	5/16/2018 17:05	4		32.45	27.80						W		971.2	
3030	5/16/2018 17:21	4		32.73		0.32					U	0.90	2366.1	1.01
3031	5/16/2018 17:38	4		30.71	24.57					0.34	UW	0.99	1315.8	0.22
3032	5/16/2018 17:54	4		31.06	19.01					0.35	UW	0.68	1393.1	
3033	5/16/2018 18:11	4		30.90							U	0.28	1311.9	0.64
3034	5/16/2018 20:15	4		24.77	21.31	0.38					C	0.33	1302.0	
3035	5/16/2018 20:32	4		22.94							W	0.14	1227.3	
3036	5/16/2018 20:48	4		22.55							C	0.25	1134.2	
3037	5/16/2018 21:05	4		20.97	21.36						W	0.02	906.2	
3038	5/16/2018 21:21	4		20.95		0.31					U	0.58	1649.2	0.34
3039	5/16/2018 21:38	4		20.43	18.35					0.34	UW	0.85	1410.2	0.07
3040	5/16/2018 21:54	4		20.19	13.34					0.34	UW	0.67	1028.7	
3041	5/16/2018 22:11	4		19.65							U	0.22	1410.8	0.16
3042	5/17/2018 0:15	4		18.79	18.15	0.37					C	0.24	882.6	
3043	5/17/2018 0:32	4		18.43							W	0.14	1148.2	
3044	5/17/2018 0:48	4		17.63							C	0.21	1012.0	
3045	5/17/2018 1:05	4		15.92	17.91						W		443.7	
3046	5/17/2018 1:22	4		15.17		0.30					U	0.48	1344.3	0.14
3047	5/17/2018 1:38	4		14.52	15.21					0.33	UW	0.34	1228.8	
3048	5/17/2018 1:55	4		13.92	10.19					0.34	UW	0.60	815.6	
3049	5/17/2018 2:11	4		13.37							U	0.28	1331.1	
3050	5/17/2018 4:15	4		11.86	15.60	0.37					C	0.21	879.7	
3051	5/17/2018 4:32	4		12.24							W	0.09	1006.3	
3052	5/17/2018 4:48	4		11.88							C	0.33	889.2	
3053	5/17/2018 5:05	4		11.70	14.68						W		580.8	
3054	5/17/2018 5:21	4		11.88		0.29					U	0.42	1285.3	0.04
3055	5/17/2018 5:38	4		11.60	12.51					0.33	UW	0.13	1066.9	0.31
3056	5/17/2018 5:55	4		11.46	7.57					0.33	UW	0.40	767.4	
3057	5/17/2018 6:11	4		11.22							U	0.48	1219.0	0.01
3058	5/17/2018 8:15	4		18.13	14.86	0.37					C	0.36	1217.3	0.02
3059	5/17/2018 8:32	4		18.82							W	0.16	1173.9	
3060	5/17/2018 8:48	4		20.05							C	0.42	1065.6	
3061	5/17/2018 9:05	4		21.14	17.48						W	0.06	730.4	0.01
3062	5/17/2018 9:21	4		21.80		0.30					U	0.61	1859.9	0.14
3063	5/17/2018 9:38	4		22.45	17.08					0.33	UW	0.18	1366.9	0.04
3064	5/17/2018 9:54	4		24.70	11.62					0.34	UW	0.39	2419.6	0.03
3065	5/17/2018 10:11	4		25.85							U	0.22	1822.5	11.35
3066	5/17/2018 12:15	4		30.59	19.81	0.37					C	0.62	1674.7	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3067	5/17/2018 12:32	4		29.16							W	0.28	1647.3	0.02
3068	5/17/2018 12:48	4		31.43							C	1.78	2370.1	
3069	5/17/2018 13:05	4		29.76	24.47						W		799.9	
3070	5/17/2018 13:21	4		29.98				0.30			U	0.81	2179.1	0.28
3071	5/17/2018 13:38	4		30.48	23.11					0.33	UW	0.32	2480.3	0.10
3072	5/17/2018 13:54	4		32.29	17.71					0.34	UW	3.11	5220.4	
3073	5/17/2018 14:11	4		32.23							U	0.34	1702.2	0.32
3074	5/17/2018 16:15	4		31.21	22.55			0.36			C	0.74	1782.8	
3075	5/17/2018 16:32	4		31.34							W	0.23	2414.7	0.10
3076	5/17/2018 16:48	4		32.40							C	1.16	2716.0	
3077	5/17/2018 17:05	4		31.38	26.41						W	0.06	1482.5	
3078	5/17/2018 17:21	4		31.03				0.30			U	0.70	2511.5	0.19
3079	5/17/2018 17:38	4		30.24	23.06					0.32	UW	0.15	2322.5	0.07
3080	5/17/2018 17:54	4		28.58	17.83					0.33	UW	2.39	6201.2	
3081	5/17/2018 18:11	4		29.68							U	0.26	1928.0	0.19
3082	5/17/2018 20:15	4		23.51	20.10			0.35			C	0.28	1108.2	
3083	5/17/2018 20:32	4		22.28							W	0.10	1216.3	
3084	5/17/2018 20:48	4		21.53							C	0.36	1152.1	
3085	5/17/2018 21:05	4		20.94	20.78						W	0.05	717.3	
3086	5/17/2018 21:21	4		20.89				0.29			U	0.35	1880.1	0.10
3087	5/17/2018 21:38	4		20.35	17.63					0.31	UW	0.08	1554.9	0.02
3088	5/17/2018 21:54	4		19.66	12.59					0.32	UW	0.88	2012.8	
3089	5/17/2018 22:11	4		19.71							U	0.16	1425.4	0.07
3090	5/18/2018 0:15	4		18.23	17.14			0.35			C	0.29	978.0	
3091	5/18/2018 0:32	4		17.45							W	0.10	1114.6	
3092	5/18/2018 0:49	4		17.13							C	0.41	1302.6	
3093	5/18/2018 1:05	4		16.85	17.24						W	0.01	711.3	
3094	5/18/2018 1:22	4		16.73				0.28			U	0.38	1540.1	0.05
3095	5/18/2018 1:38	4		16.55	14.70					0.31	UW	0.23	1760.3	0.01
3096	5/18/2018 1:55	4		16.44	9.68					0.31	UW	0.35	1389.2	
3097	5/18/2018 2:11	4		16.68							U	0.18	1361.4	0.04
3098	5/18/2018 4:15	4		17.24	15.58			0.35			C	0.37	1065.5	
3099	5/18/2018 4:32	4		16.80							W	0.14	1178.0	
3100	5/18/2018 4:48	4		16.83							C	0.74	1869.7	
3101	5/18/2018 5:05	4		16.71	15.95						W	0.03	1150.2	
3102	5/18/2018 5:21	4		16.51				0.28			U	0.35	1647.9	0.03
3103	5/18/2018 5:38	4		16.14	13.77					0.31	UW	0.14	1769.2	
3104	5/18/2018 5:55	4		16.00	8.65					0.31	UW	0.77	2634.5	
3105	5/18/2018 6:11	4		16.02							U	0.26	1538.8	0.04
3106	5/18/2018 8:15	4		17.81	15.35			0.35			C	0.36	971.1	
3107	5/18/2018 8:32	4		18.19							W	0.14	1099.7	
3108	5/18/2018 8:48	4		19.02							C	0.70	1558.8	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3109	5/18/2018 9:05	4	19.38	16.78							W	0.03	761.6	
3110	5/18/2018 9:21	4	19.40					0.28			U	0.36	1888.9	0.04
3111	5/18/2018 9:38	4	19.84	15.42							0.31UW	0.17	2023.9	0.01
3112	5/18/2018 9:54	4	21.37	10.45							0.31UW	0.98	2212.9	0.02
3113	5/18/2018 10:11	4	22.40								U	0.18	1359.0	0.14
3114	5/18/2018 12:15	4	26.29	18.69				0.35			C	0.42	1156.4	
3115	5/18/2018 12:32	4	23.70								W	0.25	2539.3	0.02
3116	5/18/2018 12:48	4	23.35								C	0.68	1637.1	
3117	5/18/2018 13:05	4	21.60	20.73							W	0.06	2138.6	
3118	5/18/2018 13:21	4	22.73								U	0.43	1831.1	0.04
3119	5/18/2018 13:38	4	21.45	18.41							0.36UW	0.20	654.3	0.21
3120	5/18/2018 13:55	4	21.48	12.93							0.38UW	0.49	1973.5	
3121	5/18/2018 14:11	4	22.86								U	0.12	860.2	
3122	5/18/2018 16:15	4	26.95	19.58				0.34			C	0.73	1570.0	
3123	5/18/2018 16:32	4	26.19								W	0.54	1953.1	0.03
3124	5/18/2018 16:48	4	28.20								C	1.11	1617.0	
3125	5/18/2018 17:05	4	25.49	22.94							W		1119.8	
3126	5/18/2018 17:21	4	26.90								U	0.73	1826.2	0.06
3127	5/18/2018 17:38	4	24.69	20.72							0.35UW	0.35	955.2	0.23
3128	5/18/2018 17:54	4	25.34	15.53							0.37UW	0.46	2849.6	
3129	5/18/2018 18:11	4	26.80								U	0.08	1013.9	0.01
3130	5/18/2018 20:15	4	22.13	19.54				0.34			C	0.14	655.1	
3131	5/18/2018 20:32	4	19.67								W	0.21	964.8	
3132	5/18/2018 20:48	4	19.56								C	0.16	815.3	
3133	5/18/2018 21:05	4	17.98	19.71							W	0.01	302.6	
3134	5/18/2018 21:21	4	18.03								U	0.30	1588.2	0.02
3135	5/18/2018 21:38	4	17.14	16.76							0.35UW	0.34	1536.6	0.04
3136	5/18/2018 21:54	4	15.92	11.60							0.36UW	0.76	2231.3	
3137	5/18/2018 22:11	4	14.94								U	0.13	1312.7	
3138	5/19/2018 0:15	4	11.09	15.56				0.33			C	0.26	994.6	
3139	5/19/2018 0:32	4	11.19								W	0.14	744.6	
3140	5/19/2018 0:49	4	10.90								C	0.57	1794.3	
3141	5/19/2018 1:05	4	10.28	14.71							W		56.1	
3142	5/19/2018 1:22	4	10.30								U	0.22	1555.5	
3143	5/19/2018 1:38	4	10.05	12.26							0.34UW	0.24	983.0	0.01
3144	5/19/2018 1:55	4	9.99	7.29							0.35UW	0.54	2140.4	
3145	5/19/2018 2:11	4	9.69								U	0.38	1545.3	
3146	5/19/2018 4:15	4	8.80	13.04				0.33			C	0.44	1529.3	
3147	5/19/2018 4:32	4	8.93								W	0.10	724.9	
3148	5/19/2018 4:48	4	9.08								C	0.58	1711.6	0.01
3149	5/19/2018 5:05	4	8.84	12.52							W		569.3	
3150	5/19/2018 5:21	4	8.94								U	1.04	3636.1	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3151	5/19/2018 5:38	4		8.87		10.39					0.34UW	0.19	802.7	
3152	5/19/2018 5:55	4		8.88		5.41					0.35UW	0.62	1275.7	
3153	5/19/2018 6:11	4		8.65							U	0.05	1236.0	
3154	5/19/2018 8:15	4		8.74		11.93		0.33			C	0.36	1405.9	0.01
3155	5/19/2018 8:32	4		8.98							W	0.17	740.3	
3156	5/19/2018 8:48	4		9.58							C	0.80	2513.1	
3157	5/19/2018 9:05	4		9.43		11.99					W		270.7	
3158	5/19/2018 9:21	4		10.14							U	0.17	1559.8	
3159	5/19/2018 9:38	4		10.21		10.50					0.33UW	0.19	791.0	
3160	5/19/2018 9:55	4		9.99		5.41					0.35UW	0.73	1654.1	0.02
3161	5/19/2018 10:14	4		10.28							U	0.17	1091.0	0.01
3162	5/19/2018 12:15	4		11.42		12.13		0.33			C	0.39	1483.8	0.02
3163	5/19/2018 12:32	4		11.57							W	0.14	670.9	
3164	5/19/2018 12:48	4		11.87							C	0.71	2254.5	
3165	5/19/2018 13:05	4		11.30		13.01					W		286.7	
3166	5/19/2018 13:21	4		11.95							U	0.24	1670.1	0.02
3167	5/19/2018 13:38	4		11.98		11.40					0.33UW	0.15	1003.4	
3168	5/19/2018 13:55	4		12.74		6.45					0.35UW	0.71	1530.2	0.01
3169	5/19/2018 14:11	4		13.72							U	0.17	1559.5	0.04
3170	5/19/2018 16:15	4		21.91		15.19		0.33			C	0.41	1699.2	0.03
3171	5/19/2018 16:32	4		21.94							W	0.14	794.6	
3172	5/19/2018 16:48	4		21.83							C	0.54	2703.3	0.49
3173	5/19/2018 17:05	4		19.78		18.23					W	0.01	371.1	
3174	5/19/2018 17:21	4		22.07							U	1.05	2205.6	0.01
3175	5/19/2018 17:38	4		21.42		16.68					0.33UW	0.20	2286.6	0.01
3176	5/19/2018 17:54	4		20.00		11.68					0.34UW	0.27	4101.0	0.54
3177	5/19/2018 18:11	4		19.34							U	0.27	1209.9	0.05
3178	5/19/2018 20:15	4		16.21		15.10		0.33			C	0.56	1420.5	0.16
3179	5/19/2018 20:32	4		15.35							W	0.13	787.6	
3180	5/19/2018 20:48	4		15.14							C	0.26	1547.3	
3181	5/19/2018 21:05	4		13.83		15.32					W		465.5	
3182	5/19/2018 21:22	4		14.06							U	0.33	1462.7	
3183	5/19/2018 21:38	4		13.02		12.58					0.33UW	0.21	1082.7	0.01
3184	5/19/2018 21:55	4		13.01		7.55					0.34UW	0.31	781.6	0.19
3185	5/19/2018 22:11	4		12.51							U	0.13	848.3	0.01
3186	5/20/2018 0:15	4		11.76		12.95		0.32			C	0.19	942.8	0.02
3187	5/20/2018 0:32	4		11.34							W	0.10	623.8	
3188	5/20/2018 0:48	4		11.11							C	0.31	1190.5	0.06
3189	5/20/2018 1:05	4		10.66		12.72					W		455.4	
3190	5/20/2018 1:22	4		11.21							U	0.26	1388.1	
3191	5/20/2018 1:38	4		10.97		10.60					0.32UW	0.18	1077.7	
3192	5/20/2018 1:55	4		11.06		5.62					0.33UW	0.32	835.5	0.07

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3193	5/20/2018 2:11	4		10.67							U	0.16	951.9	
3194	5/20/2018 4:15	4		9.54	11.56	0.32					C	0.21	1328.7	0.01
3195	5/20/2018 4:32	4		9.49							W	0.08	598.2	
3196	5/20/2018 4:48	4		9.32							C	0.80	1492.3	0.04
3197	5/20/2018 5:05	4		8.56	11.11						W	0.01	352.2	
3198	5/20/2018 5:21	4		8.46							U	0.28	2220.0	
3199	5/20/2018 5:38	4		8.33	8.86					0.32	UW	0.21	1122.3	
3200	5/20/2018 5:54	4		8.49	3.88					0.33	UW	0.13	814.4	
3201	5/20/2018 6:11	4		8.11							U	0.12	882.6	
3202	5/20/2018 8:15	4		9.82	10.60	0.32					C	0.12	842.7	0.01
3203	5/20/2018 8:32	4		10.39							W	0.15	571.6	
3204	5/20/2018 8:48	4		11.15							C	0.29	1230.1	0.02
3205	5/20/2018 9:05	4		10.55	11.10						W	0.02	428.8	
3206	5/20/2018 9:22	4		11.75							U	0.28	1090.6	
3207	5/20/2018 9:38	4		12.63	10.18					0.32	UW	0.15	981.6	
3208	5/20/2018 9:55	4		15.42	5.44					0.33	UW	0.32	1162.2	0.01
3209	5/20/2018 10:11	4		15.09							U	0.01	242.1	0.03
3210	5/22/2018 15:29	5		33.91	24.17	0.33					C	0.25	1295.3	0.04
3211	5/22/2018 15:46	5		34.60	21.80					0.30	W	0.24	4674.5	0.04
3212	5/22/2018 16:02	5		33.10							C	0.23	1207.8	0.56
3213	5/22/2018 16:19	5		35.49	24.90					0.30	W	0.13	1624.5	0.01
3214	5/22/2018 16:35	5		32.90							U	0.06	2382.5	0.23
3215	5/22/2018 16:52	5		32.16							UW	0.12	2818.3	0.37
3216	5/22/2018 17:08	5		33.93	25.78						U	0.02	2351.5	
3217	5/22/2018 17:25	5		32.98							UW	0.14	2577.5	0.14
3218	5/22/2018 19:28	5		26.13	22.31	0.32					C	0.41	1136.7	
3219	5/22/2018 19:45	5		26.82	16.75					0.29	W	0.35	2635.8	
3220	5/22/2018 20:01	5		26.14							C	0.33	1490.6	
3221	5/22/2018 20:18	5		25.01	20.47					0.29	W	0.17	1400.3	
3222	5/22/2018 20:34	5		23.81							U	0.07	1678.0	0.15
3223	5/22/2018 20:51	5		22.76							UW	0.18	2051.1	0.74
3224	5/22/2018 21:08	5		22.11	21.19						U	0.16	1184.1	
3225	5/22/2018 21:24	5		21.37							UW	0.32	1663.8	0.49
3226	5/23/2018 0:01	5		18.52							C	0.13	872.4	
3227	5/23/2018 0:17	5		18.42	18.55	0.31					C	0.08	756.9	
3228	5/23/2018 0:34	5		18.87	11.87					0.28	W	0.13	1116.3	
3229	5/23/2018 0:50	5		19.22							C	0.56	930.7	
3230	5/23/2018 1:07	5		19.68	16.98					0.28	W	0.15	1209.2	
3231	5/23/2018 1:23	5		19.41							U	0.19	1791.1	2.19
3232	5/23/2018 1:40	5		19.20							UW	0.13	1852.8	5.44
3233	5/23/2018 1:57	5		18.78	18.28						U	0.11	1211.6	
3234	5/23/2018 2:13	5		18.26							UW	0.18	1665.9	4.49

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3235	5/23/2018 4:16	5		18.50		17.52		0.31			C	0.14	794.6	
3236	5/23/2018 4:33	5		17.98		10.91					0.29W	0.19	2118.1	
3237	5/23/2018 4:49	5		17.88							C	0.31	1628.9	
3238	5/23/2018 5:06	5		17.84		15.92					0.30W	0.12	2016.5	
3239	5/23/2018 5:22	5		17.78							U	0.12	1867.5	1.27
3240	5/23/2018 5:39	5		17.66							UW	0.14	2541.2	3.03
3241	5/23/2018 5:55	5		17.52		17.36					U	0.06	1885.0	
3242	5/23/2018 6:12	5		17.46							UW	0.11	2004.1	2.92
3243	5/23/2018 8:16	5		17.79		16.86		0.32			C	0.10	582.9	
3244	5/23/2018 8:33	5		17.65		10.38					0.30W	0.12	1318.1	
3245	5/23/2018 8:49	5		17.80							C	0.15	1082.4	
3246	5/23/2018 9:06	5		18.59		15.65					0.30W	0.07	1301.4	
3247	5/23/2018 9:22	5		19.83							U	0.17	2364.3	8.00
3248	5/23/2018 9:39	5		20.56							UW	0.23	2722.7	9.54
3249	5/23/2018 9:55	5		21.32		18.26					U	0.07	2182.9	
3250	5/23/2018 10:12	5		22.27							UW	0.57	2615.5	10.14
3251	5/23/2018 12:16	5		24.90		19.13		0.32			C	0.14	708.6	
3252	5/23/2018 12:33	5		25.31		15.28					0.30W	1.49	5654.6	
3253	5/23/2018 12:49	5		26.10							C	0.25	1518.8	
3254	5/23/2018 13:06	5		27.15		19.79					0.31W	0.06	1417.2	
3255	5/23/2018 13:22	5		27.57							U	0.09	1795.8	8.55
3256	5/23/2018 13:39	5		29.60							UW	0.27	3285.2	15.50
3257	5/23/2018 13:55	5		29.47		22.35					U	0.05	1787.3	
3258	5/23/2018 14:12	5		29.90							UW	0.18	2564.6	8.15
3259	5/23/2018 16:15	5		30.34		22.63		0.32			C	0.13	846.9	
3260	5/23/2018 16:32	5		32.21		19.52					0.30W	0.37	4156.5	0.14
3261	5/23/2018 16:48	5		29.51							C	0.92	3169.3	
3262	5/23/2018 17:05	5		29.07		22.21					0.30W	0.12	1506.9	
3263	5/23/2018 17:21	5		28.35							U	0.07	1511.6	4.08
3264	5/23/2018 17:38	5		28.05							UW	0.20	2409.6	8.15
3265	5/23/2018 17:54	5		29.44		23.03					U	0.06	1342.3	
3266	5/23/2018 18:11	5		30.54				0.24			UW	0.14	1871.9	5.44
3267	5/23/2018 20:15	5		25.71		21.28		0.32			C	0.16	1013.7	
3268	5/23/2018 20:32	5		24.65		15.45					0.29W	0.11	1147.4	
3269	5/23/2018 20:48	5		23.62							C	0.09	942.0	
3270	5/23/2018 21:05	5		22.71		19.64					0.29W	0.12	1131.1	
3271	5/23/2018 21:21	5		21.59							U	0.15	1654.8	3.96
3272	5/23/2018 21:38	5		21.21							UW	0.13	1679.5	11.47
3273	5/23/2018 21:55	5		21.47		20.54					U	0.09	1193.3	
3274	5/23/2018 22:11	5		20.85				0.23			UW	0.14	1684.3	8.30
3275	5/24/2018 0:15	5		20.56		18.90		0.31			C	0.07	917.3	
3276	5/24/2018 0:32	5		20.49		12.21					0.28W	0.18	1771.7	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3277	5/24/2018 0:48	5	20.35				C	0.13	975.4	
3278	5/24/2018 1:05	5	20.65	17.28			0.29W	0.05	1174.4	
3279	5/24/2018 1:22	5	20.68				U	0.13	1505.2	3.98
3280	5/24/2018 1:38	5	20.47				UW	0.20	1770.5	10.60
3281	5/24/2018 1:55	5	20.79	18.69			U	0.10	1060.8	
3282	5/24/2018 2:11	5	20.76		0.23		UW	0.15	1495.6	6.45
3283	5/24/2018 4:15	5	19.87	18.15	0.31		C	0.17	839.2	
3284	5/24/2018 4:32	5	19.99	11.60			0.28W	0.19	1588.6	
3285	5/24/2018 4:48	5	19.70				C	0.43	1598.0	
3286	5/24/2018 5:05	5	19.61	16.58			0.29W	0.12	1115.2	
3287	5/24/2018 5:21	5	19.31				U	0.18	1289.0	2.18
3288	5/24/2018 5:38	5	19.24				UW	0.19	1763.9	5.66
3289	5/24/2018 5:54	5	19.15	17.96			U	0.09	969.0	
3290	5/24/2018 6:11	5	18.99		0.23		UW	0.15	1244.1	6.48
3291	5/24/2018 8:15	5	19.59	17.79	0.31		C	0.14	1451.7	
3292	5/24/2018 8:32	5	21.28	12.28			0.28W	0.26	3744.4	
3293	5/24/2018 8:48	5	22.35				C	0.85	2409.7	
3294	5/24/2018 9:05	5	23.38	17.54			0.29W	0.17	1389.1	
3295	5/24/2018 9:21	5	23.25				U	0.09	1221.7	4.44
3296	5/24/2018 9:38	5	25.65				UW	0.27	2389.9	7.85
3297	5/24/2018 9:54	5	25.85	20.00			U	0.09	1177.0	
3298	5/24/2018 10:11	5	25.01		0.23		UW	0.11	1285.3	6.31
3299	5/24/2018 12:15	5	34.71	22.27	0.32		C	0.19	1277.6	
3300	5/24/2018 12:32	5	33.15	20.27			0.29W	0.10	2752.3	
3301	5/24/2018 12:48	5	34.26				C	0.45	2202.3	
3302	5/24/2018 13:05	5	34.35	24.19			0.29W	0.11	1504.6	
3303	5/24/2018 13:21	5	34.34				U	0.06	1272.4	6.17
3304	5/24/2018 13:38	5	35.02				UW	0.28	2210.7	9.93
3305	5/24/2018 13:54	5	36.40	26.62			U	0.17	1773.3	
3306	5/24/2018 14:11	5	35.81		0.24		UW	0.18	1281.7	10.37
3307	5/24/2018 16:15	5	35.88	26.71	0.31		C	0.14	1455.3	
3308	5/24/2018 16:32	5	35.97	23.03			0.29W	0.28	2168.8	
3309	5/24/2018 16:48	5	35.38				C	0.44	2651.9	
3310	5/24/2018 17:05	5	34.48	26.04			0.29W	0.02	739.2	
3311	5/24/2018 17:21	5	35.25				U	0.06	758.6	2.85
3312	5/24/2018 17:38	5	34.08				UW	0.16	1462.5	4.63
3313	5/24/2018 17:54	5	34.65	27.60			U	0.63	1535.4	
3314	5/24/2018 18:11	5	31.24		0.22		UW	0.05	652.4	2.87
3315	5/24/2018 20:15	5	26.48	23.77	0.30		C	0.11	1181.2	
3316	5/24/2018 20:32	5	26.27	17.13			0.28W	0.05	788.5	
3317	5/24/2018 20:48	5	24.92				C	0.09	1103.2	
3318	5/24/2018 21:05	5	24.11	21.92			0.28W	0.07	1158.9	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3319	5/24/2018 21:21	5	23.19				U	0.07	886.9	0.80
3320	5/24/2018 21:38	5	21.93				UW	0.12	1124.8	2.29
3321	5/24/2018 21:54	5	21.43	22.34			U	0.07	571.1	
3322	5/24/2018 22:11	5	20.80		0.22		UW	0.12	842.2	1.63
3323	5/25/2018 0:15	5	18.90	20.39	0.29		C	0.11	1009.4	
3324	5/25/2018 0:32	5	18.31	12.76		0.27W		0.11	1059.3	
3325	5/25/2018 0:49	5	18.47				C	0.16	978.4	
3326	5/25/2018 1:05	5	18.23	18.28		0.27W		0.17	1033.2	
3327	5/25/2018 1:22	5	17.56				U	0.16	1128.3	0.27
3328	5/25/2018 1:38	5	16.83				UW	0.10	911.7	3.29
3329	5/25/2018 1:55	5	17.15	19.29			U	0.10	708.3	
3330	5/25/2018 2:11	5	16.20		0.21		UW	0.20	890.9	1.52
3331	5/25/2018 4:15	5	15.23	18.30	0.29		C	0.07	961.5	
3332	5/25/2018 4:32	5	14.79	10.58		0.27W		0.09	913.1	
3333	5/25/2018 4:48	5	14.71				C	0.10	910.0	
3334	5/25/2018 5:05	5	14.05	16.02		0.27W		0.06	864.9	
3335	5/25/2018 5:21	5	14.27				U	0.12	1177.7	0.37
3336	5/25/2018 5:38	5	14.39				UW	0.15	1182.2	4.02
3337	5/25/2018 5:54	5	13.66	17.22			U	0.09	566.6	
3338	5/25/2018 6:11	5	13.43		0.21		UW	0.16	985.6	2.15
3339	5/25/2018 8:15	5	18.61	17.62	0.29		C	0.09	914.7	
3340	5/25/2018 8:32	5	21.49	12.32		0.27W		0.06	729.4	
3341	5/25/2018 8:48	5	22.35				C	0.08	761.1	3.01
3342	5/25/2018 9:05	5	24.19	18.46		0.27W		0.09	818.8	
3343	5/25/2018 9:21	5	25.28				U	0.33	956.2	3.60
3344	5/25/2018 9:38	5	25.92				UW	0.13	1081.0	10.30
3345	5/25/2018 9:54	5	28.01	20.33			U	0.11	682.0	
3346	5/25/2018 10:11	5	29.58		0.22		UW	0.18	1077.8	8.75
3347	5/25/2018 12:15	5	36.15	24.26	0.30		C	0.09	958.8	
3348	5/25/2018 12:32	5	34.40	22.85		0.38W		0.60	2560.6	0.16
3349	5/25/2018 12:48	5	37.00				C	0.05	752.1	
3350	5/25/2018 13:05	5	35.17	27.28		0.37W		0.43	2723.4	0.30
3351	5/25/2018 13:21	5	36.74				U	0.06	506.6	1.76
3352	5/25/2018 13:38	5	34.88				UW	1.42	4526.6	62.91
3353	5/25/2018 13:54	5	37.39	28.53			U	0.06	429.9	
3354	5/25/2018 14:11	5	35.55		0.23		UW	0.89	3053.6	58.76
3355	5/25/2018 16:15	5	35.77	28.36	0.30		C	0.04	889.3	
3356	5/25/2018 16:32	5	36.81	25.39		0.36W		0.05	1226.5	1.59
3357	5/25/2018 16:48	5	38.07				C	0.04	864.8	
3358	5/25/2018 17:05	5	36.48	28.60		0.35W		0.11	1814.8	0.86
3359	5/25/2018 17:21	5	38.29				U	0.14	1430.7	1.17
3360	5/25/2018 17:38	5	35.62				UW	1.41	2913.1	58.40

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3361	5/25/2018 17:54	5	35.09	29.72			U	0.10	666.2	
3362	5/25/2018 18:11	5	32.57		0.22		UW	0.65	2059.1	39.19
3363	5/25/2018 20:15	5	28.52	25.75	0.29		C	0.08	859.9	
3364	5/25/2018 20:32	5	27.41	18.96			0.35W	0.07	914.0	0.96
3365	5/25/2018 20:48	5	25.54				C	0.08	872.6	
3366	5/25/2018 21:05	5	23.44	23.41			0.34W	0.05	1227.7	0.24
3367	5/25/2018 21:21	5	22.57				U	0.10	919.1	0.55
3368	5/25/2018 21:38	5	21.17				UW	0.47	1779.9	71.41
3369	5/25/2018 21:54	5	21.68	23.77			U	0.16	708.8	
3370	5/25/2018 22:11	5	20.04		0.21		UW	0.48	1221.0	35.53
3371	5/26/2018 0:15	5	15.85	21.29	0.28		C	0.10	988.4	
3372	5/26/2018 0:32	5	15.67	13.14			0.34W	0.08	1157.3	
3373	5/26/2018 0:49	5	15.22				C	0.12	902.6	
3374	5/26/2018 1:05	5	15.17	18.90			0.33W	0.07	1116.5	
3375	5/26/2018 1:22	5	14.77				U	0.08	1027.5	0.09
3376	5/26/2018 1:38	5	14.93				UW	0.71	1569.6	77.87
3377	5/26/2018 1:55	5	14.51	19.75			U	0.13	570.1	
3378	5/26/2018 2:11	5	14.36		0.21		UW	0.37	1167.5	35.04
3379	5/26/2018 4:15	5	12.61	18.61	0.27		C	0.10	976.1	
3380	5/26/2018 4:32	5	12.95	10.52			0.34W	0.07	924.0	
3381	5/26/2018 4:48	5	12.43				C	0.10	949.0	
3382	5/26/2018 5:05	5	12.79	16.30			0.33W	0.07	992.8	
3383	5/26/2018 5:22	5	12.00				U	0.08	824.5	0.03
3384	5/26/2018 5:38	5	12.61				UW	0.54	1428.0	90.14
3385	5/26/2018 5:55	5	12.20	17.38			U	0.24	632.0	
3386	5/26/2018 6:11	5	12.00		0.21		UW	0.27	1001.3	38.66
3387	5/26/2018 8:15	5	18.93	18.09	0.28		C	0.24	909.7	
3388	5/26/2018 8:32	5	21.42	12.64			0.34W	0.05	992.1	
3389	5/26/2018 8:48	5	23.35				C	0.13	743.1	32.66
3390	5/26/2018 9:05	5	24.11	18.74			0.33W	0.06	990.4	0.14
3391	5/26/2018 9:21	5	26.12				U	0.09	808.4	1.25
3392	5/26/2018 9:38	5	26.68				UW	1.60	1895.4	135.82
3393	5/26/2018 9:54	5	29.41	20.69			U	0.07	580.1	
3394	5/26/2018 10:11	5	30.13		0.22		UW	0.80	1452.8	68.08
3395	5/26/2018 12:15	5	36.38	24.55	0.29		C	0.05	404.9	
3396	5/26/2018 12:32	5	35.33	22.62			0.34W	0.16	492.5	
3397	5/26/2018 12:48	5	36.82				C	0.05	758.7	
3398	5/26/2018 13:05	5	37.08	27.35			0.33W	0.07	1646.5	0.71
3399	5/26/2018 13:21	5	37.85				U	0.05	826.1	0.43
3400	5/26/2018 13:38	5	36.72				UW	1.27	1775.5	57.56
3401	5/26/2018 13:54	5	38.60	28.69			U	0.05	150.3	
3402	5/26/2018 14:11	5	37.92		0.22		UW	0.07	1300.4	32.17

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3403	5/26/2018 16:15	5		38.92		29.40		0.28			C	0.06	979.7	
3404	5/26/2018 16:32	5		38.56		26.69					0.33W	0.05	1518.9	0.45
3405	5/26/2018 16:48	5		38.80							C	0.12	1430.8	
3406	5/26/2018 17:05	5		39.06		29.32					0.32W	0.08	1537.5	0.42
3407	5/26/2018 17:21	5		38.81							U	0.12	1162.8	0.35
3408	5/26/2018 17:38	5		38.30							UW	1.08	1467.0	28.08
3409	5/26/2018 17:54	5		39.60		31.21					U	0.07	909.0	
3410	5/26/2018 18:11	5		37.68				0.21			UW	1.02	1126.1	16.18
3411	5/26/2018 20:15	5		30.63		27.29		0.27			C	0.14	1672.0	
3412	5/26/2018 20:32	5		30.29		21.00					0.31W	0.09	1396.3	0.78
3413	5/26/2018 20:48	5		27.02							C	0.08	1110.1	
3414	5/26/2018 21:05	5		25.41		24.48					0.31W	0.19	1232.7	0.02
3415	5/26/2018 21:21	5		23.79							U	0.11	1217.9	0.17
3416	5/26/2018 21:38	5		23.06							UW	0.45	1061.3	12.71
3417	5/26/2018 21:54	5		23.18		25.23					U	0.06	670.7	
3418	5/26/2018 22:11	5		22.29				0.21			UW	0.60	1121.0	6.03
3419	5/27/2018 0:15	5		20.27		22.76		0.26			C	0.08	1028.0	
3420	5/27/2018 0:32	5		20.02		14.99					0.30W	0.06	1212.4	
3421	5/27/2018 0:49	5		19.73							C	0.09	959.3	
3422	5/27/2018 1:05	5		19.08		20.44					0.30W	0.06	1132.4	0.01
3423	5/27/2018 1:22	5		18.05							U	0.10	1068.0	0.09
3424	5/27/2018 1:38	5		18.22							UW	0.35	1064.9	5.49
3425	5/27/2018 1:55	5		18.40		21.34					U	0.08	738.1	
3426	5/27/2018 2:11	5		18.50				0.21			UW	0.20	883.3	2.74
3427	5/27/2018 4:15	5		18.33		20.50		0.26			C	0.12	949.1	
3428	5/27/2018 4:32	5		18.44		12.80					0.30W	0.13	1077.5	
3429	5/27/2018 4:48	5		18.32							C	0.09	933.3	
3430	5/27/2018 5:05	5		18.33		18.39					0.30W	0.05	946.0	0.01
3431	5/27/2018 5:21	5		18.91							U	0.13	1201.4	0.15
3432	5/27/2018 5:38	5		18.81							UW	0.30	1012.9	4.69
3433	5/27/2018 5:54	5		18.79		19.52					U	0.09	674.2	
3434	5/27/2018 6:11	5		19.22				0.21			UW	0.21	824.9	2.05
3435	5/27/2018 8:15	5		23.59		20.15		0.26			C	0.11	1495.9	
3436	5/27/2018 8:32	5		25.06		14.63					0.30W	0.13	1687.5	0.02
3437	5/27/2018 8:48	5		26.22							C	0.27	1622.0	
3438	5/27/2018 9:05	5		27.28		20.14					0.30W	0.08	876.7	0.04
3439	5/27/2018 9:21	5		28.43							U	0.15	814.3	0.28
3440	5/27/2018 9:38	5		30.24							UW	0.35	1091.1	4.34
3441	5/27/2018 9:55	5		31.96		22.73					U	0.13	791.5	
3442	5/27/2018 10:11	5		33.75				0.21			UW	0.29	905.8	3.56
3443	5/27/2018 12:15	5		35.01		25.22		0.27			C	0.20	1897.5	
3444	5/27/2018 12:32	5		36.47		23.37					0.30W	0.18	1816.5	0.14

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3445	5/27/2018 12:48	5	40.01				C	0.17	1205.4	
3446	5/27/2018 13:05	5	40.88	28.61			0.30W	0.12	1387.1	0.13
3447	5/27/2018 13:21	5	42.37				U	0.41	1019.6	0.46
3448	5/27/2018 13:38	5	42.10				UW	0.58	1536.1	9.48
3449	5/27/2018 13:54	5	43.34	30.93			U	0.12	1993.6	
3450	5/27/2018 14:11	5	41.12		0.22		UW	0.30	757.6	4.83
3451	5/27/2018 16:15	5	41.09	30.50	0.27		C	0.08	1621.8	
3452	5/27/2018 16:32	5	40.48	27.17			0.30W	0.07	933.7	0.23
3453	5/27/2018 16:48	5	41.10				C	0.45	2321.0	0.35
3454	5/27/2018 17:05	5	39.22	30.59			0.30W	0.02	873.3	0.11
3455	5/27/2018 17:21	5	38.76				U	0.08	567.2	0.16
3456	5/27/2018 17:38	5	39.37				UW	0.53	1432.4	3.83
3457	5/27/2018 17:54	5	41.47	32.29			U	0.14	1587.8	
3458	5/27/2018 18:11	5	37.85		0.21		UW	0.27	724.4	1.91
3459	5/27/2018 20:15	5	31.68	28.34	0.25		C	0.07	1236.6	
3460	5/27/2018 20:32	5	31.66	22.24			0.28W	0.07	879.9	0.83
3461	5/27/2018 20:48	5	29.71				C	0.07	998.9	
3462	5/27/2018 21:05	5	28.06	26.17			0.28W	0.06	1287.5	
3463	5/27/2018 21:21	5	26.04				U	0.07	989.2	0.09
3464	5/27/2018 21:38	5	24.58				UW	0.62	1098.7	2.19
3465	5/27/2018 21:55	5	24.35	26.84			U	0.03	620.8	
3466	5/27/2018 22:11	5	24.04		0.20		UW	0.25	1204.0	1.53
3467	5/28/2018 0:15	5	23.40	24.26	0.24		C	0.11	1338.9	
3468	5/28/2018 0:32	5	23.86	16.82			0.28W	0.07	1119.9	
3469	5/28/2018 0:48	5	23.64				C	0.10	1242.4	
3470	5/28/2018 1:05	5	24.17	22.38			0.28W	0.06	956.5	0.01
3471	5/28/2018 1:22	5	24.10				U	0.06	1133.9	0.09
3472	5/28/2018 1:38	5	23.90				UW	0.54	950.1	1.36
3473	5/28/2018 1:55	5	23.73	23.42			U	0.05	872.8	
3474	5/28/2018 2:11	5	23.21		0.20		UW	0.27	944.8	0.90
3475	5/28/2018 4:15	5	22.23	22.58	0.24		C	0.08	1091.1	
3476	5/28/2018 4:32	5	22.23	15.24			0.28W	0.03	544.7	
3477	5/28/2018 4:48	5	21.72				C	0.06	721.2	
3478	5/28/2018 5:05	5	21.42	20.61			0.27W	0.03	774.1	
3479	5/28/2018 5:21	5	20.45				U	0.06	453.8	0.04
3480	5/28/2018 5:38	5	19.56				UW	0.41	782.7	0.75
3481	5/28/2018 5:54	5	19.07	21.56			U	0.02	564.4	
3482	5/28/2018 6:11	5	18.84		0.20		UW	0.38	708.3	0.61
3483	5/28/2018 8:15	5	21.91	21.77	0.24		C	0.08	722.9	
3484	5/28/2018 8:32	5	24.13	16.23			0.28W		644.7	
3485	5/28/2018 8:48	5	24.89				C	0.04	698.5	
3486	5/28/2018 9:05	5	25.81	21.85			0.27W	0.03	1007.2	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3487	5/28/2018 9:21	5	26.66				U	0.02	525.1	0.18
3488	5/28/2018 9:38	5	27.09				UW	0.22	757.8	1.57
3489	5/28/2018 9:54	5	28.87	23.61			U	0.01	374.2	
3490	5/28/2018 10:11	5	29.74		0.21		UW	0.13	643.5	1.22
3491	5/28/2018 12:15	5	36.48	26.45	0.25		C	0.02	497.7	
3492	5/28/2018 12:32	5	36.21	24.77			0.29W		483.4	
3493	5/28/2018 12:48	5	36.14				C	0.04	760.9	
3494	5/28/2018 13:05	5	37.55	29.03			0.28W	0.07	1131.3	0.01
3495	5/28/2018 13:21	5	36.63				U		318.3	0.17
3496	5/28/2018 13:38	5	35.02				UW	0.36	710.9	1.22
3497	5/28/2018 13:54	5	37.56	30.29			U		196.2	
3498	5/28/2018 14:11	5	36.96		0.20		UW	0.04	613.9	0.99
3499	5/28/2018 16:15	5	38.70	30.76	0.25		C	0.08	918.5	
3500	5/28/2018 16:32	5	37.54	27.86			0.28W	0.01	487.8	
3501	5/28/2018 16:48	5	37.02				C		729.3	
3502	5/28/2018 17:05	5	37.36	30.75			0.28W		1427.1	0.01
3503	5/28/2018 17:21	5	36.68				U	0.08	564.1	0.08
3504	5/28/2018 17:38	5	34.21				UW	0.40	793.6	1.06
3505	5/28/2018 17:54	5	33.59	32.12			U	0.01	365.3	
3506	5/28/2018 18:11	5	34.03		0.20		UW	0.31	822.7	0.73
3507	5/28/2018 20:15	5	28.44	27.84	0.24		C	0.11	1359.2	
3508	5/28/2018 20:32	5	27.58	21.27			0.27W	0.10	1154.4	
3509	5/28/2018 20:48	5	26.40				C	0.10	1072.9	
3510	5/28/2018 21:05	5	26.94	26.04			0.26W	0.05	1380.2	
3511	5/28/2018 21:21	5	26.85				U	0.05	1387.0	0.06
3512	5/28/2018 21:38	5	26.25				UW	0.25	1162.6	0.79
3513	5/28/2018 21:55	5	26.38	26.99			U	0.01	437.3	
3514	5/28/2018 22:11	5	26.01		0.20		UW	0.21	1035.8	0.51
3515	5/29/2018 0:15	5	22.00	24.57	0.23		C	0.10	936.1	
3516	5/29/2018 0:32	5	21.60	16.90			0.26W	0.12	1260.0	
3517	5/29/2018 0:48	5	21.38				C	0.01	1056.5	
3518	5/29/2018 1:05	5	20.82	22.39			0.26W	0.07	1077.5	
3519	5/29/2018 1:22	5	19.78				U	0.11	1049.2	0.01
3520	5/29/2018 1:38	5	19.23				UW	0.18	938.9	0.34
3521	5/29/2018 1:55	5	18.69	23.35			U	0.03	621.1	
3522	5/29/2018 2:11	5	19.42		0.20		UW	0.25	979.5	0.24
3523	5/29/2018 4:15	5	20.22	22.34	0.23		C	0.19	1267.0	
3524	5/29/2018 4:32	5	19.84	14.61			0.26W	0.21	2175.7	
3525	5/29/2018 4:48	5	19.63				C	0.16	1357.4	
3526	5/29/2018 5:05	5	19.18	20.13			0.26W	0.08	1090.8	
3527	5/29/2018 5:21	5	18.60				U	0.07	918.3	0.02
3528	5/29/2018 5:38	5	18.43				UW	0.21	1061.4	0.18

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3529	5/29/2018 5:54	5	18.21	21.23							U	0.05	680.9	
3530	5/29/2018 6:11	5	17.55					0.20			UW	0.25	731.8	0.11
3531	5/29/2018 8:15	5	22.67	21.46				0.23			C	0.10	1241.2	
3532	5/29/2018 8:32	5	25.20	15.89						0.27W		0.16	2218.3	
3533	5/29/2018 8:48	5	22.64								C	0.23	1806.1	
3534	5/29/2018 9:05	5	21.48	20.50						0.26W		0.07	818.8	
3535	5/29/2018 9:21	5	23.66								U	0.04	689.9	0.07
3536	5/29/2018 9:38	5	26.15								UW	0.20	902.9	0.38
3537	5/29/2018 9:54	5	27.43	22.93							U	0.05	737.9	
3538	5/29/2018 10:11	5	28.63					0.20			UW	0.25	619.8	0.29
3539	5/29/2018 12:15	5	33.90	25.60				0.24			C	0.11	1106.9	
3540	5/29/2018 12:32	5	31.86	23.03						0.37W		1.00	2840.5	0.04
3541	5/29/2018 12:48	5	36.55								C	0.30	2606.5	
3542	5/29/2018 13:05	5	30.73	27.21						0.36W		0.69	1814.2	0.05
3543	5/29/2018 13:21	5	31.69								U	0.04	711.5	0.01
3544	5/29/2018 13:38	5	30.38								UW	0.91	2967.3	9.55
3545	5/29/2018 13:54	5	33.09	28.64							U	0.09	867.2	
3546	5/29/2018 14:11	5	31.41					0.20			UW	0.62	1886.9	6.87
3547	5/29/2018 16:15	5	30.98	27.16				0.23			C	0.04	1372.6	
3548	5/29/2018 16:32	5	30.19	22.48						0.35W		0.08	1892.0	0.03
3549	5/29/2018 16:48	5	30.70								C	0.20	2046.4	
3550	5/29/2018 17:05	5	28.53	26.83						0.34W		0.06	1019.1	0.14
3551	5/29/2018 17:21	5	31.83								U	0.04	569.4	
3552	5/29/2018 17:38	5	30.49								UW	1.02	1940.5	6.74
3553	5/29/2018 17:54	5	29.43	28.18							U	0.12	1490.4	
3554	5/29/2018 18:11	5	25.05					0.20			UW	0.33	1015.6	4.65
3555	5/29/2018 20:15	5	21.33	24.24				0.22			C	0.09	1002.6	
3556	5/29/2018 20:32	5	20.81	16.69						0.34W		0.08	1223.8	
3557	5/29/2018 20:48	5	20.64								C		862.4	
3558	5/29/2018 21:05	5	19.93	22.11						0.33W		0.04	1442.3	
3559	5/29/2018 21:21	5	19.37								U	0.07	892.0	
3560	5/29/2018 21:38	5	19.12								UW	0.50	1568.5	2.90
3561	5/29/2018 21:54	5	18.73	23.04							U	0.04	817.6	
3562	5/29/2018 22:11	5	18.82					0.19			UW	0.34	1061.1	3.20
3563	5/30/2018 0:15	5	18.09	21.72				0.22			C	0.06	907.3	
3564	5/30/2018 0:32	5	17.71	13.71						0.34W		0.06	1444.8	
3565	5/30/2018 0:48	5	17.56								C	0.08	1095.0	
3566	5/30/2018 1:05	5	17.52	19.38						0.33W		0.18	1039.6	
3567	5/30/2018 1:21	5	17.55								U		881.1	
3568	5/30/2018 1:38	5	17.61								UW	0.49	1473.8	2.20
3569	5/30/2018 1:55	5	17.30	20.69							U	0.07	943.9	
3570	5/30/2018 2:11	5	17.23					0.19			UW	0.30	1024.4	2.47

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3571	5/30/2018 4:15	5		17.32		20.37		0.22			C	0.08	875.5	
3572	5/30/2018 4:32	5		16.85		12.44					0.33W	0.15	976.7	
3573	5/30/2018 4:48	5		16.51							C	0.08	813.3	
3574	5/30/2018 5:05	5		17.02		18.07					0.33W	0.04	899.1	
3575	5/30/2018 5:21	5		16.81							U	0.04	674.8	
3576	5/30/2018 5:38	5		17.09							UW	0.48	1280.9	3.16
3577	5/30/2018 5:54	5		16.76		19.56					U	0.03	683.4	
3578	5/30/2018 6:11	5		17.04				0.19			UW	0.28	1071.0	5.65
3579	5/30/2018 8:15	5		18.29		19.86		0.22			C	0.08	1045.9	
3580	5/30/2018 8:32	5		18.62		12.69					0.33W	0.06	2441.9	0.02
3581	5/30/2018 8:48	5		19.14							C	0.11	1014.2	
3582	5/30/2018 9:05	5		19.27		18.24					0.33W	0.06	1094.5	0.01
3583	5/30/2018 9:21	5		20.00							U	0.05	709.9	0.18
3584	5/30/2018 9:38	5		20.07							UW	0.46	1408.8	3.21
3585	5/30/2018 9:55	5		20.36		20.07					U	0.04	776.6	
3586	5/30/2018 10:11	5		20.29				0.20			UW	0.28	976.8	5.77
3587	5/30/2018 12:15	5		29.47		21.83		0.23			C	0.13	1110.6	
3588	5/30/2018 12:32	5		28.32		19.01					0.33W	0.15	1746.7	0.10
3589	5/30/2018 12:48	5		29.15							C	0.06	1427.5	
3590	5/30/2018 13:05	5		28.25		23.18					0.33W	0.09	1176.2	0.05
3591	5/30/2018 13:21	5		29.88							U	0.06	688.2	0.09
3592	5/30/2018 13:38	5		28.90							UW	0.89	1433.9	4.30
3593	5/30/2018 13:54	5		30.94		25.73					U	0.07	658.5	
3594	5/30/2018 14:11	5		29.86				0.20			UW	0.60	1124.9	13.78
3595	5/30/2018 16:15	5		32.66		26.35		0.23			C	0.09	1324.0	
3596	5/30/2018 16:32	5		30.47		23.35					0.32W	0.38	2683.1	0.18
3597	5/30/2018 16:48	5		29.97							C	0.07	1010.7	
3598	5/30/2018 17:05	5		26.80		26.04					0.32W	0.07	1180.8	0.18
3599	5/30/2018 17:21	5		26.73							U	0.07	949.6	
3600	5/30/2018 17:38	5		25.90							UW	0.68	1189.2	3.37
3601	5/30/2018 17:54	5		29.30		26.89					U	0.05	672.6	
3602	5/30/2018 18:11	5		31.29				0.20			UW	0.37	1057.6	10.02
3603	5/30/2018 20:15	5		25.87		24.94		0.22			C	0.09	1366.1	
3604	5/30/2018 20:32	5		25.71		19.01					0.31W	0.12	1198.8	0.27
3605	5/30/2018 20:48	5		23.83							C	0.06	890.6	
3606	5/30/2018 21:05	5		21.98		22.42					0.31W	0.05	1172.2	
3607	5/30/2018 21:21	5		21.13							U	0.06	1063.2	
3608	5/30/2018 21:38	5		20.16							UW	0.43	1008.8	1.42
3609	5/30/2018 21:54	5		19.63		23.66					U	0.04	552.7	
3610	5/30/2018 22:11	5		18.91				0.19			UW	0.25	801.9	2.47
3611	5/31/2018 0:15	5		15.71		21.46		0.22			C	0.05	851.9	
3612	5/31/2018 0:32	5		15.70		13.41					0.30W	0.10	872.6	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3613	5/31/2018 0:48	5		15.01							C	0.07	811.2	
3614	5/31/2018 1:05	5		14.75	18.73						0.30W	0.08	825.0	
3615	5/31/2018 1:21	5		14.25							U	0.08	733.3	
3616	5/31/2018 1:38	5		14.67							UW	0.28	959.2	0.83
3617	5/31/2018 1:55	5		14.12	20.12						U		428.1	
3618	5/31/2018 2:11	5		14.18				0.19			UW	0.21	954.7	2.25
3619	5/31/2018 4:15	5		13.60	19.25			0.21			C	0.06	963.6	
3620	5/31/2018 4:32	5		13.87	11.16						0.30W	0.08	853.4	
3621	5/31/2018 4:48	5		13.25							C	0.08	884.8	
3622	5/31/2018 5:05	5		13.02	16.67						0.30W	0.10	807.3	
3623	5/31/2018 5:21	5		12.71							U	0.06	823.4	
3624	5/31/2018 5:38	5		13.34							UW	0.26	962.1	0.76
3625	5/31/2018 5:55	5		13.35	18.17						U		452.2	
3626	5/31/2018 6:11	5		12.75				0.19			UW	0.20	666.1	2.39
3627	5/31/2018 8:15	5		18.96	18.89			0.21			C	0.05	605.9	
3628	5/31/2018 8:32	5		20.51	13.17						0.30W	0.05	1402.9	0.01
3629	5/31/2018 8:48	5		21.73							C	0.07	1196.7	1.35
3630	5/31/2018 9:05	5		22.64	19.35						0.30W	0.05	1062.6	0.02
3631	5/31/2018 9:21	5		24.14							U	0.09	1083.5	0.21
3632	5/31/2018 9:38	5		24.81							UW	0.31	1105.7	1.56
3633	5/31/2018 9:54	5		26.67	21.16						U		445.0	
3634	5/31/2018 10:11	5		28.17				0.20			UW	0.25	895.3	3.77
3635	5/31/2018 12:15	5		34.39	24.42			0.23			C	0.06	1273.2	
3636	5/31/2018 12:32	5		33.87	23.60						0.31W	0.01	1453.6	
3637	5/31/2018 12:48	5		36.02							C	0.06	923.0	
3638	5/31/2018 13:05	5		35.46	28.40						0.31W	0.11	1886.3	0.18
3639	5/31/2018 13:21	5		36.42							U	0.06	889.2	0.05
3640	5/31/2018 13:38	5		35.47							UW	1.28	1128.6	1.83
3641	5/31/2018 13:55	5		37.53	30.30						U		459.8	
3642	5/31/2018 14:11	5		36.59				0.20			UW	0.31	1074.7	4.85
3643	5/31/2018 16:15	5		36.12	29.46			0.23			C	0.08	1130.9	
3644	5/31/2018 16:32	5		37.89	28.31						0.30W	0.07	1485.5	0.03
3645	5/31/2018 16:48	5		38.96							C	0.09	1466.8	
3646	5/31/2018 17:05	5		38.10	30.47						0.30W	0.16	1833.5	0.17
3647	5/31/2018 17:21	5		37.88							U	0.10	1858.2	0.02
3648	5/31/2018 17:38	5		35.29							UW	0.65	1212.7	1.48
3649	5/31/2018 17:54	5		36.76	32.45						U	0.02	759.8	
3650	5/31/2018 18:11	5		35.53				0.20			UW	0.27	856.3	2.34
3651	5/31/2018 20:15	5		26.85	27.24			0.22			C	0.05	1623.6	
3652	5/31/2018 20:32	5		25.64	20.73						0.28W	0.07	1713.0	
3653	5/31/2018 20:48	5		23.92							C	0.09	1067.9	
3654	5/31/2018 21:05	5		23.31	24.52						0.29W	0.07	1081.5	0.02

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3655	5/31/2018 21:21	5		22.65							U	0.07	1151.1	
3656	5/31/2018 21:38	5		21.22							UW	0.31	1071.8	0.43
3657	5/31/2018 21:54	5		20.90	25.70						U	0.01	483.1	
3658	5/31/2018 22:11	5		19.99				0.19			UW	0.38	859.3	0.44
3659	6/1/2018 0:15	5		16.57	22.60			0.21			C	0.06	1249.3	
3660	6/1/2018 0:32	5		16.86	14.55					0.28W		0.05	963.2	
3661	6/1/2018 0:49	5		16.51							C	0.10	1095.2	
3662	6/1/2018 1:05	5		16.15	20.06					0.28W		0.04	846.6	
3663	6/1/2018 1:22	5		14.59							U	0.10	867.0	
3664	6/1/2018 1:38	5		14.94							UW	0.17	844.1	0.14
3665	6/1/2018 1:55	5		15.04	21.35						U	0.04	498.1	
3666	6/1/2018 2:11	5		15.69				0.19			UW	0.20	718.6	0.24
3667	6/1/2018 4:15	5		14.75	20.19			0.20			C	0.04	1054.7	
3668	6/1/2018 4:32	5		15.34	12.20					0.28W		0.05	1031.8	
3669	6/1/2018 4:48	5		14.72							C	0.10	928.3	
3670	6/1/2018 5:05	5		15.21	17.87					0.28W		0.05	942.5	
3671	6/1/2018 5:21	5		15.32							U	0.06	1017.9	
3672	6/1/2018 5:38	5		15.84							UW	0.19	851.2	0.09
3673	6/1/2018 5:54	5		15.69	19.45						U	0.02	583.8	
3674	6/1/2018 6:11	5		15.90				0.19			UW	0.15	666.8	0.12
3675	6/1/2018 8:15	5		20.29	20.06			0.21			C	0.08	988.7	
3676	6/1/2018 8:32	5		22.59	14.53					0.28W		0.13	1797.3	0.01
3677	6/1/2018 8:48	5		23.06							C	0.05	813.4	
3678	6/1/2018 9:05	5		24.58	20.64					0.28W		0.03	1263.7	
3679	6/1/2018 9:21	5		25.65							U	0.05	804.9	0.06
3680	6/1/2018 9:38	5		26.74							UW	0.28	988.5	0.44
3681	6/1/2018 9:55	5		27.25	22.24						U	0.01	729.5	
3682	6/1/2018 10:11	5		29.12				0.20			UW	0.15	839.6	0.59
3683	6/1/2018 12:15	5		35.17	25.47			0.22			C	0.05	1676.5	
3684	6/1/2018 12:32	5		33.86	25.16					0.38W		0.26	4682.9	0.04
3685	6/1/2018 12:48	5		37.50							C	0.08	1188.4	
3686	6/1/2018 13:05	5		34.47	29.14					0.37W		0.31	2003.4	0.07
3687	6/1/2018 13:21	5		38.07							U	0.02	756.8	4.55
3688	6/1/2018 13:38	5		35.34							UW	0.83	3206.4	2.50
3689	6/1/2018 13:54	5		38.91	30.82						U	0.05	863.4	
3690	6/1/2018 14:11	5		36.32				0.20			UW	0.72	1621.9	6.69
3691	6/1/2018 16:15	5		37.59	29.98			0.22			C	0.05	1198.8	
3692	6/1/2018 16:32	5		36.71	28.88					0.35W		0.14	4976.5	0.09
3693	6/1/2018 16:48	5		39.78							C	0.11	3154.1	
3694	6/1/2018 17:05	5		36.88	30.65					0.34W		0.16	1539.4	0.12
3695	6/1/2018 17:21	5		38.43							U	0.06	582.5	
3696	6/1/2018 17:38	5		36.41							UW	0.86	1883.6	2.29

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3697	6/1/2018 17:54	5		38.14		32.47					U	0.05	1585.4	
3698	6/1/2018 18:11	5		36.71				0.19			UW	0.42	801.0	4.42
3699	6/1/2018 20:15	5		29.42		27.51		0.21			C	0.07	1513.0	
3700	6/1/2018 20:32	5		28.49		21.51					0.33W	0.11	2602.0	0.03
3701	6/1/2018 20:48	5		28.57							C	0.08	1021.1	
3702	6/1/2018 21:05	5		27.71		26.09					0.33W	0.11	1373.6	0.09
3703	6/1/2018 21:21	5		28.13							U	0.03	774.6	
3704	6/1/2018 21:38	5		27.10							UW	0.17	1209.4	0.81
3705	6/1/2018 21:54	5		27.01		26.98					U	0.02	786.0	
3706	6/1/2018 22:11	5		26.17				0.19			UW	0.29	670.6	1.35
3707	6/2/2018 0:15	5		17.49		23.28		0.20			C	0.01	1404.7	
3708	6/2/2018 0:32	5		17.44		14.27					0.37W	0.02	631.3	
3709	6/2/2018 0:49	5		17.30							C	0.06	1131.0	
3710	6/2/2018 1:05	5		17.27		20.42					0.39W	0.02	458.0	
3711	6/2/2018 1:21	5		17.28							U	0.05	968.1	
3712	6/2/2018 1:38	5		17.55							UW	0.52	714.5	0.03
3713	6/2/2018 1:55	5		17.19		21.32					U	0.06	1103.7	
3714	6/2/2018 2:11	5		17.13				0.26			UW	0.24	476.3	0.08
3715	6/2/2018 4:15	5		17.39		20.26		0.31			C	0.05	980.0	
3716	6/2/2018 4:32	5		17.60		12.27					0.40W	0.19	598.9	
3717	6/2/2018 4:48	5		17.49							C	0.23	2103.7	
3718	6/2/2018 5:05	5		17.41		18.16					0.38W	0.07	1630.0	
3719	6/2/2018 5:21	5		17.23							U	0.20	1873.6	
3720	6/2/2018 5:38	5		17.37							UW	0.95	903.4	0.02
3721	6/2/2018 5:54	5		17.13		19.49					U	0.30	2068.0	0.02
3722	6/2/2018 6:11	5		17.16				0.34			UW	0.38	694.7	0.13
3723	6/2/2018 8:15	5		17.17		19.30		0.32			C	0.02	656.5	
3724	6/2/2018 8:32	5		17.72		11.73					0.39W	0.64	720.6	
3725	6/2/2018 8:48	5		18.01							C	0.01	955.0	
3726	6/2/2018 9:05	5		16.80		17.35					0.37W	0.05	560.4	
3727	6/2/2018 9:21	5		16.47							U	0.06	1435.7	
3728	6/2/2018 9:38	5		16.31							UW	0.57	843.0	0.02
3729	6/2/2018 9:54	5		16.56		18.76					U	0.02	935.7	0.03
3730	6/2/2018 10:11	5		18.43				0.30			UW	0.36	730.0	0.17
3731	6/2/2018 12:15	5		24.10		20.67		0.32			C	0.02	807.5	
3732	6/2/2018 12:32	5		22.36		15.56					0.38W	0.01	911.6	
3733	6/2/2018 12:48	5		23.61							C		999.9	
3734	6/2/2018 13:05	5		22.41		20.95					0.36W	0.01	346.9	
3735	6/2/2018 13:21	5		24.07							U	0.06	1522.1	0.53
3736	6/2/2018 13:38	5		23.01							UW	0.73	973.5	
3737	6/2/2018 13:54	5		23.71		22.46					U	0.01	1067.9	0.07
3738	6/2/2018 14:11	5		24.08				0.28			UW	0.24	974.1	0.19

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3739	6/2/2018 16:15	5		26.07		22.13		0.31			C		703.6	
3740	6/2/2018 16:32	5		25.96		17.09					0.35W	0.02	822.7	
3741	6/2/2018 16:48	5		26.46							C		939.6	
3742	6/2/2018 17:05	5		22.99		21.20					0.34W	0.02	1894.5	
3743	6/2/2018 17:21	5		24.74							U		2216.7	0.84
3744	6/2/2018 17:38	5		23.37							UW	0.40	765.3	
3745	6/2/2018 17:54	5		22.92		21.96					U	0.03	1170.7	0.05
3746	6/2/2018 18:11	5		22.99				0.26			UW	0.19	519.3	0.24
3747	6/2/2018 20:15	5		20.15		19.91		0.30			C	0.02	619.5	
3748	6/2/2018 20:32	5		19.02		12.39					0.33W	0.01	448.2	
3749	6/2/2018 20:48	5		18.70							C	0.03	773.9	
3750	6/2/2018 21:05	5		17.45		17.55					0.33W		891.9	
3751	6/2/2018 21:21	5		16.80							U	0.13	1099.0	0.29
3752	6/2/2018 21:38	5		16.35							UW	0.30	576.6	
3753	6/2/2018 21:54	5		15.59		18.14					U	0.03	877.7	0.02
3754	6/2/2018 22:11	5		14.48				0.24			UW	0.11	424.2	0.02
3755	6/3/2018 0:15	5		12.11		17.37		0.29			C	0.06	1035.7	
3756	6/3/2018 0:32	5		12.39		8.67					0.33W	0.05	567.5	
3757	6/3/2018 0:48	5		12.64							C	0.07	887.3	
3758	6/3/2018 1:05	5		12.95		14.63					0.33W	0.02	506.4	
3759	6/3/2018 1:21	5		12.93							U	0.11	1072.5	0.07
3760	6/3/2018 1:38	5		13.10							UW	0.42	573.0	
3761	6/3/2018 1:55	5		12.64		15.67					U		787.0	0.04
3762	6/3/2018 2:11	5		13.08				0.23			UW	0.13	452.5	0.03
3763	6/3/2018 4:15	5		11.33		15.75		0.29			C	0.02	599.8	0.71
3764	6/3/2018 4:32	5		11.99		7.05					0.32W	0.04	572.0	
3765	6/3/2018 4:48	5		11.91							C	0.03	623.8	
3766	6/3/2018 5:05	5		11.59		12.85					0.32W	0.02	656.0	
3767	6/3/2018 5:21	5		11.61							U	0.16	897.5	0.13
3768	6/3/2018 5:38	5		11.76							UW	0.19	556.0	
3769	6/3/2018 5:54	5		11.49		13.94					U		609.6	0.01
3770	6/3/2018 6:11	5		11.48				0.23			UW	0.02	358.4	
3771	6/3/2018 8:15	5		13.54		14.72		0.29			C	0.01	436.6	0.03
3772	6/3/2018 8:32	5		14.24		7.48					0.32W	0.03	310.7	
3773	6/3/2018 8:48	5		14.89							C	0.01	811.3	
3774	6/3/2018 9:05	5		15.39		13.72					0.32W	0.04	822.0	0.56
3775	6/3/2018 9:21	5		16.12							U	0.08	654.7	0.53
3776	6/3/2018 9:38	5		16.93							UW	0.17	441.6	
3777	6/3/2018 9:54	5		17.58		15.31					U	0.01	655.6	0.01
3778	6/3/2018 10:11	5		18.77				0.24			UW	0.10	350.0	0.04
3779	6/3/2018 12:15	5		24.26		18.36		0.29			C	0.01	699.0	
3780	6/3/2018 12:32	5		24.05		15.38					0.32W		329.7	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3781	6/3/2018 12:48	5		25.66							C	0.04	941.0	
3782	6/3/2018 13:05	5		25.89		20.35					0.32W	0.07	1211.4	2.16
3783	6/3/2018 13:21	5		25.68							U	0.26	1613.1	1.80
3784	6/3/2018 13:38	5		25.75							UW	0.42	574.7	
3785	6/3/2018 13:54	5		26.67		21.85					U	0.04	728.2	0.14
3786	6/3/2018 14:11	5		26.25				0.24			UW	0.18	553.9	0.06
3787	6/3/2018 16:15	5		27.98		22.26		0.29			C	0.04	1044.9	
3788	6/3/2018 16:32	5		28.17		19.09					0.31W	0.09	756.9	
3789	6/3/2018 16:48	5		28.27							C	0.03	772.0	0.10
3790	6/3/2018 17:05	5		28.28		22.24					0.31W	0.11	809.6	0.07
3791	6/3/2018 17:21	5		28.03							U	0.51	509.6	1.63
3792	6/3/2018 17:38	5		27.62							UW	0.32	464.5	
3793	6/3/2018 17:54	5		27.95		24.09					U		203.1	0.12
3794	6/3/2018 18:11	5		27.06				0.23			UW	0.15	181.9	0.03
3795	6/3/2018 20:15	5		21.81		20.94		0.28			C	0.05	801.6	
3796	6/3/2018 20:32	5		22.17		14.17					0.30W	0.04	511.7	
3797	6/3/2018 20:48	5		19.29							C	0.02	410.3	
3798	6/3/2018 21:05	5		17.96		18.72					0.30W	0.08	680.4	0.11
3799	6/3/2018 21:21	5		16.09							U	0.32	1669.5	0.69
3800	6/3/2018 21:38	5		14.49							UW	0.20	227.1	
3801	6/3/2018 21:54	5		13.54		19.32					U	0.05	683.2	0.04
3802	6/3/2018 22:11	5		12.68				0.22			UW	0.11	553.4	
3803	6/4/2018 0:15	5		10.07		17.37		0.27			C	0.08	998.3	
3804	6/4/2018 0:32	5		10.19		8.84					0.29W	0.02	715.1	
3805	6/4/2018 0:49	5		9.78							C	0.10	754.7	
3806	6/4/2018 1:05	5		10.06		14.79					0.30W	0.07	681.8	
3807	6/4/2018 1:22	5		9.86							U	0.19	1011.0	0.02
3808	6/4/2018 1:38	5		9.71							UW	0.22	612.5	
3809	6/4/2018 1:55	5		9.34		15.71					U	0.02	529.3	0.02
3810	6/4/2018 2:11	5		9.35				0.22			UW	0.08	398.1	
3811	6/4/2018 4:15	5		8.24		15.31		0.27			C	0.06	884.1	0.25
3812	6/4/2018 4:32	5		8.63		6.75					0.29W	0.02	596.5	
3813	6/4/2018 4:48	5		8.57							C	0.09	871.2	
3814	6/4/2018 5:05	5		8.35		12.71					0.30W	0.07	511.6	
3815	6/4/2018 5:21	5		8.09							U	0.24	785.5	0.09
3816	6/4/2018 5:38	5		8.33							UW	0.15	550.5	
3817	6/4/2018 5:54	5		8.11		13.81					U	0.02	395.2	0.04
3818	6/4/2018 6:11	5		9.40				0.21			UW	0.12	468.0	
3819	6/4/2018 8:15	5		18.47		15.45		0.27			C	0.11	1199.4	0.02
3820	6/4/2018 8:32	5		19.87		9.46					0.30W	0.06	715.9	0.01
3821	6/4/2018 8:48	5		20.14							C	0.14	1529.5	
3822	6/4/2018 9:05	5		21.32		15.58					0.30W	0.03	458.0	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3823	6/4/2018 9:21	5		21.94							U	0.19	792.3	3.04
3824	6/4/2018 9:38	5		22.76							UW	0.26	701.8	
3825	6/4/2018 9:54	5		23.72	17.47						U	0.09	1095.7	0.07
3826	6/4/2018 10:11	5		24.98				0.22			UW	0.10	547.6	
3827	6/4/2018 12:15	5		31.14	20.45			0.28			C	0.02	1359.9	
3828	6/4/2018 12:32	5		31.31	18.66					0.30W		0.05	799.8	
3829	6/4/2018 12:48	5		32.36							C	0.22	1854.1	
3830	6/4/2018 13:05	5		32.41	23.80					0.30W		0.03	640.3	0.02
3831	6/4/2018 13:21	5		32.92							U	0.22	860.5	1.38
3832	6/4/2018 13:38	5		33.20							UW	0.42	859.2	
3833	6/4/2018 13:54	5		34.27	26.31						U	0.06	1881.8	0.27
3834	6/4/2018 14:11	5		33.96				0.22			UW	0.23	501.0	
3835	6/4/2018 16:15	5		35.00	25.29			0.28			C	0.01	1043.6	
3836	6/4/2018 16:32	5		35.36	22.53					0.30W			432.9	
3837	6/4/2018 16:48	5		34.62							C	0.06	982.7	0.79
3838	6/4/2018 17:05	5		32.89	26.66					0.30W		0.02	594.7	0.04
3839	6/4/2018 17:21	5		33.32							U	0.16	518.6	1.21
3840	6/4/2018 17:38	5		32.24							UW	0.33	710.9	
3841	6/4/2018 17:54	5		32.09	28.21						U	0.04	1209.2	0.17
3842	6/4/2018 18:11	5		31.61				0.22			UW	0.18	412.8	
3843	6/4/2018 20:15	5		27.23	23.73			0.27			C	0.04	1168.0	
3844	6/4/2018 20:32	5		27.36	17.78					0.28W		0.03	561.9	
3845	6/4/2018 20:48	5		25.67							C	0.02	815.6	
3846	6/4/2018 21:05	5		24.79	22.86					0.29W		0.06	637.4	
3847	6/4/2018 21:21	5		23.70							U	0.13	580.0	0.50
3848	6/4/2018 21:38	5		23.06							UW	0.25	672.4	
3849	6/4/2018 21:54	5		22.40	23.62						U	0.03	716.4	0.10
3850	6/4/2018 22:11	5		21.74				0.21			UW	0.15	566.9	
3851	6/5/2018 0:15	5		19.01	20.64			0.26			C	0.07	1183.1	
3852	6/5/2018 0:32	5		19.22	13.09					0.28W		0.02	716.5	
3853	6/5/2018 0:48	5		19.35							C	0.05	1034.2	
3854	6/5/2018 1:05	5		19.85	19.21					0.28W			880.8	
3855	6/5/2018 1:22	5		19.84							U		829.3	0.20
3856	6/5/2018 1:38	5		19.86							UW	0.22	723.8	
3857	6/5/2018 1:55	5		19.42	20.29						U	0.04	897.3	0.05
3858	6/5/2018 2:11	5		19.02				0.21			UW	0.14	607.4	
3859	6/5/2018 4:15	5		16.23	18.96			0.26			C	0.04	1047.4	
3860	6/5/2018 4:32	5		16.14	11.08					0.28W		0.05	932.2	
3861	6/5/2018 4:48	5		15.79							C	0.06	952.0	
3862	6/5/2018 5:05	5		15.85	17.06					0.28W		0.05	765.5	
3863	6/5/2018 5:21	5		15.49							U	0.13	878.8	0.04
3864	6/5/2018 5:38	5		14.83							UW	0.15	640.3	0.62

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3865	6/5/2018 5:55	5		14.99		18.17					U	0.05	496.4	0.05
3866	6/5/2018 6:11	5		14.60				0.20			UW	0.10	509.1	
3867	6/5/2018 8:15	5		20.05		18.32		0.26			C	0.01	988.0	
3868	6/5/2018 8:32	5		21.93		12.88					0.28W	0.03	939.7	
3869	6/5/2018 8:48	5		22.47							C	0.06	1195.7	
3870	6/5/2018 9:05	5		23.83		19.26					0.28W	0.06	617.7	
3871	6/5/2018 9:21	5		24.59							U	0.11	837.6	0.57
3872	6/5/2018 9:38	5		25.85							UW	0.19	723.4	
3873	6/5/2018 9:54	5		27.63		21.31					U	0.04	843.3	0.08
3874	6/5/2018 10:11	5		28.92				0.21			UW	0.12	593.3	0.01
3875	6/5/2018 12:15	5		36.99		24.21		0.27			C	0.05	1239.9	
3876	6/5/2018 12:32	5		37.67		24.49					0.29W	0.04	1292.8	
3877	6/5/2018 12:48	5		39.16							C	0.04	1334.5	
3878	6/5/2018 13:05	5		38.98		29.50					0.29W	0.06	1458.0	0.03
3879	6/5/2018 13:21	5		39.12							U	0.21	1150.5	0.98
3880	6/5/2018 13:38	5		39.07							UW	0.19	1076.5	
3881	6/5/2018 13:54	5		40.38		31.63					U	0.08	1298.2	0.21
3882	6/5/2018 14:11	5		40.08				0.21			UW	0.20	996.4	0.03
3883	6/5/2018 16:15	5		40.38		29.20		0.27			C	0.03	2008.8	
3884	6/5/2018 16:32	5		40.59		28.50					0.29W	0.07	1590.2	1.43
3885	6/5/2018 16:48	5		40.12							C	0.08	1641.9	
3886	6/5/2018 17:05	5		39.90		31.36					0.28W	0.07	1085.2	0.04
3887	6/5/2018 17:21	5		40.06							U	0.13	876.2	0.63
3888	6/5/2018 17:38	5		39.26							UW	0.34	1191.3	
3889	6/5/2018 17:54	5		39.74		33.94					U	0.07	1402.2	0.12
3890	6/5/2018 18:11	5		38.78				0.21			UW	0.19	818.9	0.09
3891	6/5/2018 20:15	5		31.72		26.96		0.26			C		1635.8	
3892	6/5/2018 20:32	5		31.44		22.28					0.27W	0.08	1669.2	
3893	6/5/2018 20:48	5		29.04							C	0.01	1232.4	
3894	6/5/2018 21:05	5		28.35		26.28					0.27W	0.08	1371.9	
3895	6/5/2018 21:21	5		27.59							U	0.20	1182.4	0.26
3896	6/5/2018 21:38	5		26.36							UW	0.31	1089.2	
3897	6/5/2018 21:54	5		26.70		27.48					U	0.05	886.4	0.06
3898	6/5/2018 22:11	5		26.22				0.20			UW	0.40	993.6	0.01
3899	6/6/2018 0:15	5		24.49		23.64		0.25			C	0.04	1349.9	
3900	6/6/2018 0:32	5		24.43		17.11					0.27W	0.09	1606.7	
3901	6/6/2018 0:48	5		24.51							C	0.09	1775.3	
3902	6/6/2018 1:05	5		24.74		22.87					0.27W	0.10	1477.7	
3903	6/6/2018 1:21	5		24.46							U	0.06	755.9	0.14
3904	6/6/2018 1:38	5		24.29							UW	0.21	1579.1	
3905	6/6/2018 1:54	5		24.27		24.22					U	0.06	1510.4	0.04
3906	6/6/2018 2:11	5		24.09				0.20			UW	0.08	835.7	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3907	6/6/2018 4:15	5		18.93		21.70		0.26			C		1144.9	
3908	6/6/2018 4:32	5		19.25		13.81					0.31W	0.06	1877.8	
3909	6/6/2018 4:48	5		19.09							C	0.19	2352.2	
3910	6/6/2018 5:05	5		18.96		19.79					0.32W	0.02	1088.3	
3911	6/6/2018 5:21	5		18.81							U	0.07	1498.0	
3912	6/6/2018 5:38	5		18.75							UW	0.45	1305.7	0.01
3913	6/6/2018 5:55	5		18.27		20.91					U		960.7	0.03
3914	6/6/2018 6:11	5		17.86				0.23			UW	0.12	863.3	0.01
3915	6/6/2018 8:15	5		18.42		20.08		0.26			C	0.05	1148.0	
3916	6/6/2018 8:32	5		19.33		13.00					0.31W	0.02	1494.0	
3917	6/6/2018 8:48	5		19.90							C	0.01	1648.4	
3918	6/6/2018 9:05	5		21.07		19.39					0.31W	0.04	1230.0	0.01
3919	6/6/2018 9:21	5		21.77							U	0.14	1589.9	0.11
3920	6/6/2018 9:38	5		22.37							UW	0.69	1307.8	2.41
3921	6/6/2018 9:55	5		23.38		21.84					U	0.02	1303.3	0.05
3922	6/6/2018 10:11	5		25.59				0.21			UW	0.24	1092.1	0.02
3923	6/6/2018 12:15	5		32.36		24.67		0.28			C	0.02	1722.8	
3924	6/6/2018 12:32	5		32.35		22.48					0.32W	0.01	1564.2	
3925	6/6/2018 12:48	5		33.94							C		1735.1	
3926	6/6/2018 13:05	5		32.09		27.51					0.31W	0.05	1570.2	
3927	6/6/2018 13:21	5		33.75							U	0.34	2430.1	2.70
3928	6/6/2018 13:38	5		33.81							UW	1.23	1637.1	
3929	6/6/2018 13:54	5		34.17		29.64					U	0.06	2147.3	0.67
3930	6/6/2018 14:11	5		33.88				0.22			UW	0.36	1550.5	
3931	6/6/2018 16:15	5		31.65		26.88		0.28			C		1454.2	
3932	6/6/2018 16:32	5		33.28		23.52					0.30W	0.17	2650.7	
3933	6/6/2018 16:48	5		32.47							C	0.07	2158.6	
3934	6/6/2018 17:05	5		28.21		26.81					0.30W	0.08	1616.4	
3935	6/6/2018 17:21	5		25.78							U	0.32	1559.9	0.39
3936	6/6/2018 17:38	5		25.34							UW	0.35	1182.6	
3937	6/6/2018 17:54	5		25.93		26.51					U	0.04	756.4	0.09
3938	6/6/2018 18:11	5		24.51				0.21			UW	0.17	1058.4	
3939	6/6/2018 20:15	5		23.31		23.13		0.27			C		1965.3	
3940	6/6/2018 20:32	5		23.11		16.21					0.29W	0.05	2449.9	
3941	6/6/2018 20:48	5		21.57							C	0.03	1154.7	
3942	6/6/2018 21:05	5		20.73		21.61					0.29W	0.02	957.5	
3943	6/6/2018 21:21	5		19.80							U	0.15	1401.5	0.26
3944	6/6/2018 21:38	5		19.32							UW	0.29	1028.7	
3945	6/6/2018 21:54	5		18.96		21.85					U	0.02	683.4	0.01
3946	6/6/2018 22:11	5		18.26				0.20			UW	0.10	838.9	
3947	6/7/2018 0:15	5		15.89		20.24		0.26			C	0.06	1056.2	
3948	6/7/2018 0:32	5		15.80		12.39					0.28W	0.03	1000.1	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3949	6/7/2018 0:49	5		15.19							C	0.08	1040.6	
3950	6/7/2018 1:05	5		15.37	18.31					0.28	W	0.03	726.8	
3951	6/7/2018 1:22	5		15.39							U	0.19	1021.4	
3952	6/7/2018 1:38	5		15.73							UW	0.27	830.5	0.01
3953	6/7/2018 1:55	5		15.70	19.20						U	0.03	638.7	0.05
3954	6/7/2018 2:11	5		15.92				0.20			UW	0.15	744.0	0.63
3955	6/7/2018 4:15	5		15.97	18.54			0.26			C	0.01	1655.2	
3956	6/7/2018 4:32	5		16.66	10.69					0.28	W	0.01	1696.4	
3957	6/7/2018 4:48	5		16.59							C	0.03	1163.5	
3958	6/7/2018 5:05	5		16.70	16.71					0.28	W	0.03	1142.2	0.28
3959	6/7/2018 5:21	5		16.54							U	0.25	1340.3	0.27
3960	6/7/2018 5:38	5		16.59							UW	0.16	936.6	
3961	6/7/2018 5:54	5		16.41	17.72						U	0.02	382.0	
3962	6/7/2018 6:11	5		16.60				0.20			UW	0.11	806.8	
3963	6/7/2018 8:15	5		17.21	18.05			0.26			C	0.06	1285.3	0.40
3964	6/7/2018 8:32	5		17.88	10.92					0.28	W	0.07	1853.9	
3965	6/7/2018 8:48	5		18.12							C	0.09	1256.2	
3966	6/7/2018 9:05	5		18.62	16.96					0.28	W	0.03	1020.0	
3967	6/7/2018 9:21	5		19.14							U	0.07	759.5	0.13
3968	6/7/2018 9:38	5		19.22							UW	0.28	883.3	
3969	6/7/2018 9:54	5		19.07	18.33						U	0.04	547.4	0.04
3970	6/7/2018 10:11	5		19.16				0.20			UW	0.13	797.7	
3971	6/7/2018 12:15	5		19.28	19.02			0.26			C	0.01	1938.9	
3972	6/7/2018 12:32	5		19.74	12.74					0.28	W	0.08	4900.5	
3973	6/7/2018 12:48	5		20.14							C		942.1	
3974	6/7/2018 13:05	5		20.18	18.14					0.28	W	0.04	1297.1	
3975	6/7/2018 13:21	5		21.66							U	0.18	1481.1	0.14
3976	6/7/2018 13:38	5		24.09							UW	0.29	1007.4	
3977	6/7/2018 13:55	5		26.00	20.41						U	0.02	1054.1	0.02
3978	6/7/2018 14:11	5		26.35				0.20			UW	0.07	951.4	
3979	6/7/2018 16:15	5		25.29	20.80			0.26			C	0.02	1572.1	
3980	6/7/2018 16:32	5		25.33	16.75					0.28	W	0.10	2070.9	
3981	6/7/2018 16:48	5		24.30							C	0.05	1337.1	
3982	6/7/2018 17:05	5		23.64	21.38					0.28	W	0.07	858.8	
3983	6/7/2018 17:21	5		22.20							U	0.09	744.9	0.15
3984	6/7/2018 17:38	5		20.91							UW	0.30	926.6	
3985	6/7/2018 17:54	5		20.88	21.41						U	0.01	664.4	0.07
3986	6/7/2018 18:11	5		20.53				0.20			UW	0.11	711.7	
3987	6/7/2018 20:15	5		19.25	19.69			0.25			C	0.01	1001.2	
3988	6/7/2018 20:32	5		19.52	12.88					0.28	W	0.05	1273.3	
3989	6/7/2018 20:48	5		19.64							C		1072.8	
3990	6/7/2018 21:05	5		19.41	18.58					0.27	W	0.05	1014.4	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
3991	6/7/2018 21:21	5		18.45							U	0.05	760.8	0.03
3992	6/7/2018 21:38	5		18.00							UW	0.26	1013.9	0.47
3993	6/7/2018 21:54	5		17.62	19.13						U	0.02	754.8	0.03
3994	6/7/2018 22:11	5		17.49				0.20			UW	0.11	685.9	
3995	6/8/2018 0:15	5		17.75	18.39			0.25			C	0.08	818.3	
3996	6/8/2018 0:32	5		18.03	11.32					0.27W		0.01	973.2	
3997	6/8/2018 0:49	5		17.95							C	0.06	921.9	
3998	6/8/2018 1:05	5		18.04	17.09					0.27W			741.0	
3999	6/8/2018 1:22	5		17.53							U	0.25	809.4	0.02
4000	6/8/2018 1:38	5		17.66							UW	0.22	698.6	0.02
4001	6/8/2018 1:55	5		17.37	18.18						U	0.03	547.7	0.03
4002	6/8/2018 2:11	5		17.02				0.20			UW	0.07	546.5	
4003	6/8/2018 4:15	5		17.83	18.05			0.25			C	0.07	937.4	
4004	6/8/2018 4:32	5		17.84	11.06					0.27W		0.07	1591.9	
4005	6/8/2018 4:48	5		17.52							C	0.03	984.7	
4006	6/8/2018 5:05	5		17.09	16.58					0.27W		0.07	830.4	
4007	6/8/2018 5:21	5		16.69							U	0.11	741.4	0.02
4008	6/8/2018 5:38	5		16.46							UW	0.22	723.9	0.03
4009	6/8/2018 5:54	5		16.09	17.66						U	0.02	419.4	0.01
4010	6/8/2018 6:11	5		16.19				0.20			UW	0.07	570.9	0.39
4011	6/8/2018 8:15	5		18.44	18.14			0.25			C	0.02	1283.9	
4012	6/8/2018 8:32	5		19.00	11.94					0.29W		0.05	1778.7	
4013	6/8/2018 8:48	5		19.64							C	0.07	1804.5	
4014	6/8/2018 9:05	5		20.40	17.68					0.28W		0.04	1355.3	
4015	6/8/2018 9:21	5		20.24							U	0.09	788.5	0.05
4016	6/8/2018 9:38	5		22.08							UW	0.35	1448.5	0.37
4017	6/8/2018 9:54	5		22.98	20.16						U	0.06	1504.0	0.01
4018	6/8/2018 10:11	5		24.26				0.19			UW	0.19	1242.2	
4019	6/8/2018 12:15	5		30.34	21.93			0.26			C	0.02	1436.6	
4020	6/8/2018 12:32	5		31.57	20.44					0.29W		0.11	2458.2	
4021	6/8/2018 12:48	5		31.41							C	0.09	2377.2	
4022	6/8/2018 13:05	5		29.50	23.78					0.28W		0.03	843.1	
4023	6/8/2018 13:21	5		29.87							U	0.16	789.9	0.38
4024	6/8/2018 13:38	5		32.45							UW	0.63	1258.0	
4025	6/8/2018 13:54	5		33.90	26.34						U	0.07	1398.1	0.09
4026	6/8/2018 14:11	5		33.20				0.21			UW	0.27	1032.1	
4027	6/8/2018 16:15	5		33.04	24.70			0.26			C		1397.5	
4028	6/8/2018 16:32	5		35.82	23.47					0.29W		0.01	781.5	
4029	6/8/2018 16:48	5		35.70							C	0.05	1363.0	
4030	6/8/2018 17:05	5		34.96	26.93					0.28W		0.04	851.2	
4031	6/8/2018 17:21	5		34.60							U	0.20	728.5	0.46
4032	6/8/2018 17:38	5		34.45							UW	0.46	808.1	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4033	6/8/2018 17:54	5		35.73		29.38					U	0.03	854.8	0.24
4034	6/8/2018 18:11	5		33.53				0.21			UW	0.17	707.9	
4035	6/8/2018 20:15	5		27.64		24.15		0.26			C		1544.7	
4036	6/8/2018 20:32	5		26.96		19.40					0.28W	0.03	1211.9	
4037	6/8/2018 20:48	5		25.29							C	0.05	1289.4	
4038	6/8/2018 21:05	5		24.72		23.29					0.27W	0.02	914.1	
4039	6/8/2018 21:21	5		24.12							U	0.16	943.9	0.11
4040	6/8/2018 21:38	5		23.50							UW	0.43	1008.2	
4041	6/8/2018 21:54	5		23.40		24.54					U	0.06	736.9	0.09
4042	6/8/2018 22:11	5		22.32				0.20			UW	0.15	756.4	
4043	6/9/2018 0:15	5		21.20		21.45		0.25			C	0.03	1128.7	
4044	6/9/2018 0:32	5		21.57		14.95					0.27W	0.07	1397.5	
4045	6/9/2018 0:48	5		21.59							C	0.02	1069.8	
4046	6/9/2018 1:05	5		21.76		20.52					0.27W	0.02	1113.2	
4047	6/9/2018 1:21	5		21.56							U	0.09	895.1	0.02
4048	6/9/2018 1:38	5		21.55							UW	0.48	1023.9	0.07
4049	6/9/2018 1:55	5		21.50		22.04					U	0.03	708.7	0.05
4050	6/9/2018 2:11	5		21.34				0.20			UW	0.05	869.0	
4051	6/9/2018 4:15	5		18.50		20.46		0.25			C	0.01	1356.0	
4052	6/9/2018 4:32	5		18.77		13.20					0.27W	0.05	1094.2	
4053	6/9/2018 4:48	5		18.64							C	0.03	1284.1	
4054	6/9/2018 5:05	5		18.77		18.86					0.27W	0.08	896.6	
4055	6/9/2018 5:21	5		18.71							U	0.13	1061.1	
4056	6/9/2018 5:38	5		18.82							UW	0.25	931.2	0.01
4057	6/9/2018 5:54	5		18.70		20.36					U	0.02	788.3	0.02
4058	6/9/2018 6:11	5		18.70				0.22			UW	0.12	956.3	0.09
4059	6/9/2018 8:15	5		19.39		19.86		0.25			C	0.01	1347.9	
4060	6/9/2018 8:32	5		19.92		13.18					0.28W	0.04	1868.7	
4061	6/9/2018 8:48	5		21.15							C	0.06	2083.6	
4062	6/9/2018 9:05	5		21.26		19.04					0.27W	0.07	1312.5	0.01
4063	6/9/2018 9:22	5		21.07							U	0.18	1293.4	
4064	6/9/2018 9:38	5		20.95							UW	0.31	1459.0	0.12
4065	6/9/2018 9:55	5		20.33		20.73					U	0.02	530.2	0.03
4066	6/9/2018 10:11	5		20.56				0.20			UW	0.09	833.7	
4067	6/9/2018 12:15	5		21.14		20.66		0.29			C	0.06	1222.2	
4068	6/9/2018 12:32	5		21.80		14.59					0.32W	0.08	1370.3	
4069	6/9/2018 12:48	5		23.51							C	0.02	1971.0	
4070	6/9/2018 13:05	5		23.57		20.17					0.32W		1101.3	0.01
4071	6/9/2018 13:21	5		23.47							U	0.13	1204.5	0.08
4072	6/9/2018 13:38	5		22.75							UW	0.70	1453.8	
4073	6/9/2018 13:55	5		21.73		21.79					U	0.01	1353.6	0.01
4074	6/9/2018 14:11	5		21.08				0.22			UW	0.16	1132.2	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4075	6/9/2018 16:15	5		29.82		23.05		0.30			C		1704.0	
4076	6/9/2018 16:32	5		29.86		19.99					0.32W	0.04	2023.6	2.33
4077	6/9/2018 16:48	5		30.70							C	0.01	1689.9	
4078	6/9/2018 17:05	5		28.93		22.66					0.32W	0.09	2454.0	
4079	6/9/2018 17:21	5		29.07							U	0.30	1747.4	0.27
4080	6/9/2018 17:38	5		29.19							UW	0.89	1440.0	
4081	6/9/2018 17:54	5		29.63		25.57					U	0.06	1060.0	0.04
4082	6/9/2018 18:11	5		29.33				0.22			UW	0.34	1215.8	
4083	6/9/2018 20:15	5		22.60		22.80		0.30			C		1414.0	
4084	6/9/2018 20:32	5		22.57		15.82					0.31W	0.06	1765.3	
4085	6/9/2018 20:48	5		21.11							C		1294.0	
4086	6/9/2018 21:05	5		19.92		19.62					0.30W	0.03	943.3	
4087	6/9/2018 21:21	5		19.23							U	0.15	1094.4	
4088	6/9/2018 21:38	5		18.79							UW	0.49	1096.8	
4089	6/9/2018 21:55	5		18.27		21.12					U	0.07	727.6	0.01
4090	6/9/2018 22:11	5		18.04				0.20			UW	0.20	805.3	0.67
4091	6/10/2018 0:16	5		18.98		20.21		0.30			C	0.05	1661.0	
4092	6/10/2018 0:32	5		19.18		12.70					0.31W	0.07	1637.4	
4093	6/10/2018 0:49	5		19.17							C	0.03	1558.9	
4094	6/10/2018 1:05	5		19.17		17.90					0.30W	0.03	937.8	
4095	6/10/2018 1:22	5		19.11							U	0.13	949.6	
4096	6/10/2018 1:38	5		19.13							UW	0.39	1208.6	0.02
4097	6/10/2018 1:55	5		18.96		19.65					U	0.01	920.5	0.03
4098	6/10/2018 2:11	5		18.98				0.20			UW	0.46	935.9	0.03
4099	6/10/2018 4:15	5		16.21		19.22		0.30			C	0.03	1060.5	
4100	6/10/2018 4:32	5		15.80		10.91					0.31W	0.04	1075.0	
4101	6/10/2018 4:48	5		15.67							C	0.08	1125.5	
4102	6/10/2018 5:05	5		16.33		16.38					0.29W	0.04	791.3	
4103	6/10/2018 5:22	5		16.91							U	0.14	989.2	
4104	6/10/2018 5:38	5		17.39							UW	0.33	1042.4	
4105	6/10/2018 5:55	5		17.23		18.27					U	0.10	1060.8	0.01
4106	6/10/2018 6:11	5		17.44				0.20			UW	0.17	802.7	0.03
4107	6/10/2018 8:16	5		19.27		18.95		0.29			C	0.07	1454.6	
4108	6/10/2018 8:32	5		19.94		12.29					0.31W	0.04	1568.1	
4109	6/10/2018 8:49	5		20.15							C	0.04	1541.4	
4110	6/10/2018 9:05	5		20.45		17.62					0.30W	0.04	955.8	
4111	6/10/2018 9:22	5		21.36							U	0.11	812.8	0.09
4112	6/10/2018 9:38	5		22.32							UW	0.42	1545.1	0.22
4113	6/10/2018 9:55	5		22.88		20.20					U	0.03	661.8	
4114	6/10/2018 10:11	5		24.91				0.21			UW	0.05	987.0	0.01
4115	6/10/2018 12:15	5		29.45		21.95		0.30			C		1816.0	
4116	6/10/2018 12:32	5		30.93		20.45					0.31W	0.14	3322.0	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4117	6/10/2018 12:48	5	31.11				C	0.06	1669.6	
4118	6/10/2018 13:05	5	31.74	25.10			0.30W	0.02	1112.0	
4119	6/10/2018 13:21	5	31.71				U	0.12	1206.6	0.18
4120	6/10/2018 13:38	5	31.88				UW	0.81	1507.4	
4121	6/10/2018 13:54	5	33.14	26.75			U	0.04	1020.8	0.04
4122	6/10/2018 14:11	5	33.24		0.22		UW	0.27	1290.6	
4123	6/10/2018 16:15	5	32.26	24.89	0.30		C		1799.9	
4124	6/10/2018 16:32	5	33.19	23.59			0.30W	0.10	4886.6	
4125	6/10/2018 16:48	5	32.99				C	0.01	1560.0	
4126	6/10/2018 17:05	5	32.03	26.80			0.29W		1452.3	
4127	6/10/2018 17:21	5	31.58				U	0.11	798.5	0.10
4128	6/10/2018 17:38	5	31.40				UW	0.50	1775.3	
4129	6/10/2018 17:54	5	30.36	27.73			U	0.01	1034.4	0.01
4130	6/10/2018 18:11	5	30.83		0.21		UW	0.61	1000.2	
4131	6/10/2018 20:15	5	24.73	23.15	0.29		C		1803.8	
4132	6/10/2018 20:32	5	24.96	18.21			0.29W	0.11	4695.2	
4133	6/10/2018 20:48	5	23.56				C	0.07	1565.3	
4134	6/10/2018 21:05	5	22.79	22.44			0.28W	0.03	1531.8	
4135	6/10/2018 21:21	5	21.85				U	0.04	812.8	
4136	6/10/2018 21:38	5	21.26				UW	0.34	1538.6	0.04
4137	6/10/2018 21:55	5	20.87	22.98			U	0.06	865.9	
4138	6/10/2018 22:11	5	20.58		0.20		UW	0.10	997.5	0.26
4139	6/11/2018 0:15	5	20.02	20.89	0.28		C	0.03	957.1	
4140	6/11/2018 0:32	5	20.27	14.22			0.28W	0.09	4449.9	
4141	6/11/2018 0:49	5	20.15				C	0.02	1437.2	
4142	6/11/2018 1:05	5	20.30	19.72			0.28W	0.02	1633.1	
4143	6/11/2018 1:22	5	20.15				U	0.03	805.1	
4144	6/11/2018 1:38	5	20.20				UW	0.28	1380.2	0.01
4145	6/11/2018 1:55	5	19.98	20.85			U	0.02	613.7	0.01
4146	6/11/2018 2:11	5	19.88		0.20		UW	0.11	923.7	0.03
4147	6/11/2018 4:15	5	18.31	19.86	0.28		C		1377.9	
4148	6/11/2018 4:32	5	18.23	12.73			0.28W	0.12	2757.0	
4149	6/11/2018 4:48	5	17.98				C	0.05	1559.1	
4150	6/11/2018 5:05	5	18.14	18.25			0.28W	0.01	1010.1	
4151	6/11/2018 5:21	5	18.31				U	0.03	687.6	
4152	6/11/2018 5:38	5	18.64				UW	0.25	1182.6	0.01
4153	6/11/2018 5:55	5	18.63	19.54			U	0.10	452.5	0.01
4154	6/11/2018 6:11	5	18.81		0.20		UW	0.15	609.9	0.01
4155	6/11/2018 8:15	5	18.99	19.40	0.28		C	0.01	1020.5	
4156	6/11/2018 8:32	5	19.47	12.67			0.28W	0.05	1231.2	
4157	6/11/2018 8:48	5	19.21				C	0.04	1378.4	
4158	6/11/2018 9:05	5	19.07	17.99			0.28W	0.05	1108.2	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4159	6/11/2018 9:21	5		18.90							U	0.19	1167.0	
4160	6/11/2018 9:38	5		18.78							UW	0.24	1209.8	
4161	6/11/2018 9:54	5		18.70	19.40						U	0.01	395.7	
4162	6/11/2018 10:11	5		18.81				0.20			UW	0.15	1508.8	0.01
4163	6/11/2018 12:15	5		19.40	19.46			0.28			C		1407.2	
4164	6/11/2018 12:32	5		20.21	12.89					0.29W		0.08	1808.2	
4165	6/11/2018 12:48	5		19.85							C	0.06	1145.9	
4166	6/11/2018 13:05	5		19.17	18.13					0.28W		0.03	969.2	
4167	6/11/2018 13:22	5		19.48							U	0.05	1096.6	
4168	6/11/2018 13:38	5		19.71							UW	0.29	1305.9	
4169	6/11/2018 13:55	5		19.10	19.66						U	0.03	604.5	
4170	6/11/2018 14:11	5		18.88				0.21			UW	0.16	807.5	0.01
4171	6/11/2018 16:15	5		17.69	18.82			0.31			C	0.13	2534.4	
4172	6/11/2018 16:32	5		17.90	11.44					0.32W			1367.9	
4173	6/11/2018 16:49	5		18.12							C	0.10	2143.8	
4174	6/11/2018 17:05	5		18.31	17.09					0.33W		0.03	480.9	
4175	6/11/2018 17:22	5		18.68							U	0.07	702.1	
4176	6/11/2018 17:38	5		19.31							UW	0.50	1166.7	
4177	6/11/2018 17:55	5		19.15	19.22						U	0.04	1409.0	0.01
4178	6/11/2018 18:11	5		19.73				0.27			UW	0.18	731.0	0.01
4179	6/11/2018 20:15	5		19.11	19.35			0.32			C		1695.4	
4180	6/11/2018 20:32	5		19.35	12.35					0.33W		0.04	1218.3	
4181	6/11/2018 20:49	5		19.08							C	0.06	1484.4	
4182	6/11/2018 21:05	5		18.82	17.56					0.33W			569.1	
4183	6/11/2018 21:22	5		18.63							U	0.25	1019.0	
4184	6/11/2018 21:38	5		18.78							UW	0.33	1075.4	0.01
4185	6/11/2018 21:55	5		18.54	19.01						U	0.02	665.5	
4186	6/11/2018 22:11	5		18.42				0.25			UW	0.19	920.4	0.01
4187	6/12/2018 0:16	5		18.45	18.88			0.32			C		1224.9	
4188	6/12/2018 0:32	5		18.56	11.57					0.34W		0.01	1105.8	
4189	6/12/2018 0:49	5		18.37							C	0.01	1482.5	
4190	6/12/2018 1:05	5		18.04	16.91					0.33W		0.03	710.9	
4191	6/12/2018 1:22	5		17.63							U	0.26	1129.1	
4192	6/12/2018 1:38	5		17.97							UW	0.56	1112.3	
4193	6/12/2018 1:55	5		17.92	18.39						U	0.06	656.6	
4194	6/12/2018 2:12	5		17.95				0.25			UW	0.28	1120.8	0.01
4195	6/12/2018 4:15	5		17.77	18.48			0.32			C	0.03	860.1	
4196	6/12/2018 4:32	5		17.76	11.05					0.34W		0.07	1126.3	
4197	6/12/2018 4:48	5		17.72							C	0.03	1320.3	
4198	6/12/2018 5:05	5		17.64	16.47					0.33W		0.03	725.5	
4199	6/12/2018 5:21	5		17.41							U	0.29	1108.5	
4200	6/12/2018 5:38	5		17.39							UW	0.52	946.2	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4201	6/12/2018 5:55	5		17.15		18.07					U	0.06	643.3	
4202	6/12/2018 6:11	5		17.10				0.25			UW	0.22	735.7	
4203	6/12/2018 8:15	5		19.04		18.48		0.32			C	0.04	1058.2	
4204	6/12/2018 8:32	5		19.13		11.89					0.34W	0.06	969.9	
4205	6/12/2018 8:48	5		19.03							C	0.08	1068.9	
4206	6/12/2018 9:05	5		19.10		17.17					0.33W	0.10	886.6	
4207	6/12/2018 9:21	5		19.56							U	0.28	1217.3	
4208	6/12/2018 9:38	5		19.18							UW	0.58	984.9	0.03
4209	6/12/2018 9:55	5		19.08		19.17					U	0.02	571.2	
4210	6/12/2018 10:11	5		20.94				0.25			UW	0.26	799.6	0.01
4211	6/12/2018 12:15	5		19.24		19.12		0.32			C	0.01	1276.4	1.20
4212	6/12/2018 12:32	5		21.32		13.12					0.33W	0.05	1397.1	
4213	6/12/2018 12:48	5		21.98							C	0.08	1595.0	
4214	6/12/2018 13:05	5		21.96		18.69					0.33W	0.10	1039.1	0.06
4215	6/12/2018 13:21	5		22.18							U	0.33	1310.3	0.02
4216	6/12/2018 13:38	5		25.38							UW	0.65	1076.3	0.44
4217	6/12/2018 13:55	5		24.80		21.89					U	0.06	1165.9	
4218	6/12/2018 14:11	5		22.00				0.24			UW	0.38	1031.8	
4219	6/12/2018 16:15	6		29.20		22.82		0.32			C	0.03	1303.7	
4220	6/12/2018 16:32	6		28.30				0.27			C	0.09	1243.0	
4221	6/12/2018 16:48	6		26.62							C		1400.0	
4222	6/12/2018 17:05	6		29.03							C	0.11	1112.4	
4223	6/12/2018 17:21	6		25.48		23.01		0.37			U	0.12	2315.9	0.24
4224	6/12/2018 17:38	6		27.11		18.26		-0.04			U	0.02	2492.5	0.02
4225	6/12/2018 17:54	6		26.02		25.48					U	0.07	2463.5	0.34
4226	6/12/2018 18:11	6		26.09							U	0.59	2538.1	2.48
4227	6/12/2018 20:15	6		21.36		21.24		0.31			C	0.03	1368.9	
4228	6/12/2018 20:32	6		22.41				0.26			C	0.06	817.1	
4229	6/12/2018 20:48	6		19.69							C	0.02	1085.0	
4230	6/12/2018 21:05	6		18.91							C	0.10	910.4	
4231	6/12/2018 21:21	6		17.05		18.51		0.36			U	0.22	1919.8	2.04
4232	6/12/2018 21:38	6		15.64		13.22		-0.04			U	0.08	1968.7	
4233	6/12/2018 21:55	6		14.96		20.54					U	0.14	1572.0	1.37
4234	6/12/2018 22:11	6		14.35							U	0.22	1888.0	8.45
4235	6/13/2018 0:15	6		11.02		18.14		0.30			C	0.03	975.5	
4236	6/13/2018 0:32	6		10.33				0.25			C	0.06	719.8	
4237	6/13/2018 0:49	6		10.23							C	0.02	865.5	
4238	6/13/2018 1:05	6		9.29							C	0.11	633.1	
4239	6/13/2018 1:22	6		9.60		14.43		0.36			U	0.16	1403.3	4.68
4240	6/13/2018 1:38	6		9.15		9.05		-0.04			U	0.09	1299.6	1.37
4241	6/13/2018 1:55	6		8.96		16.06					U	0.10	1517.5	2.41
4242	6/13/2018 2:11	6		8.34							U	0.17	1418.8	14.25

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4243	6/13/2018 4:18	6		7.22		15.60		0.30			C	0.04	858.7	
4244	6/13/2018 4:35	6		6.87				0.25			C		552.3	
4245	6/13/2018 4:51	6		6.83							C	0.08	923.6	
4246	6/13/2018 5:08	6		6.44							C	0.09	679.4	
4247	6/13/2018 5:24	6		7.48		11.79		0.36			U	0.16	1474.0	6.12
4248	6/13/2018 5:41	6		6.81		6.35		-0.04			U	0.06	1115.8	1.37
4249	6/13/2018 5:57	6		6.84		13.27					U	0.06	1238.1	2.73
4250	6/13/2018 6:14	6		6.95							U	0.14	1364.3	14.02
4251	6/13/2018 8:15	6		13.40		15.05		0.30			C	0.05	801.0	
4252	6/13/2018 8:32	6		16.05				0.25			C	0.01	619.0	
4253	6/13/2018 8:48	6		16.52							C	0.05	879.4	0.03
4254	6/13/2018 9:05	6		18.26							C	0.06	712.6	
4255	6/13/2018 9:21	6		19.12		15.79		0.36			U	0.14	1891.5	25.88
4256	6/13/2018 9:38	6		22.18		12.59		-0.04			U	0.11	1683.0	4.10
4257	6/13/2018 9:54	6		22.69		19.58					U	0.14	1839.9	18.72
4258	6/13/2018 10:11	6		24.41							U	1.09	1933.9	40.30
4259	6/13/2018 12:15	6		32.16		20.36		0.31			C	0.09	1152.0	
4260	6/13/2018 12:32	6		32.16				0.26			C		905.4	
4261	6/13/2018 12:48	6		32.47							C	0.04	1255.5	
4262	6/13/2018 13:05	6		32.93							C	0.15	777.9	1.22
4263	6/13/2018 13:21	6		32.82		24.89		0.36			U	0.16	1850.5	20.93
4264	6/13/2018 13:38	6		32.38		22.60		-0.04			U	0.24	1687.7	2.62
4265	6/13/2018 13:54	6		32.67		29.74					U	0.17	1751.5	4.30
4266	6/13/2018 14:11	6		31.89							U	0.44	1498.9	10.08
4267	6/13/2018 16:15	6		19.97		20.90		0.30			C	0.08	1771.8	
4268	6/13/2018 16:32	6		19.38				0.25			C	0.12	864.4	
4269	6/13/2018 16:48	6		21.10							C	0.06	1823.3	
4270	6/13/2018 17:05	6		22.08							C	0.14	1012.9	
4271	6/13/2018 17:21	6		22.12		19.68		0.35			U	0.14	1343.7	4.60
4272	6/13/2018 17:38	6		21.45		15.56		-0.04			U	0.08	989.5	0.78
4273	6/13/2018 17:54	6		19.35		22.83					U	0.09	1188.6	1.48
4274	6/13/2018 18:11	6		19.93							U	0.02	1238.5	2.65
4275	6/13/2018 20:15	6		18.93		19.02		0.29			C	0.05	1161.0	
4276	6/13/2018 20:32	6		18.61				0.25			C	0.12	736.8	
4277	6/13/2018 20:48	6		17.44							C	0.02	1177.1	
4278	6/13/2018 21:05	6		17.28							C	0.08	663.1	
4279	6/13/2018 21:21	6		17.37		17.19		0.35			U	0.13	1243.6	4.90
4280	6/13/2018 21:38	6		17.23		12.73		-0.04			U	0.07	935.5	
4281	6/13/2018 21:55	6		17.07		20.05					U	0.08	991.7	1.22
4282	6/13/2018 22:11	6		16.90							U	0.41	1010.2	0.81
4283	6/14/2018 0:15	6		14.92		17.63		0.29			C	0.02	878.9	
4284	6/14/2018 0:32	6		15.24				0.25			C	0.06	559.0	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4285	6/14/2018 0:48	6		15.01							C	0.04	897.8	
4286	6/14/2018 1:05	6		14.31							C	0.06	589.8	
4287	6/14/2018 1:22	6		14.10	15.03	0.35					U	0.15	1275.8	6.54
4288	6/14/2018 1:38	6		14.06	10.26	-0.04					U	0.12	1015.8	
4289	6/14/2018 1:55	6		13.77	17.40						U	0.10	899.9	0.61
4290	6/14/2018 2:11	6		14.05							U	0.18	940.7	0.90
4291	6/14/2018 4:15	6		15.00	16.49	0.28					C	0.04	1043.4	
4292	6/14/2018 4:32	6		14.86		0.25					C	0.05	620.1	
4293	6/14/2018 4:48	6		14.94							C	0.05	1012.7	
4294	6/14/2018 5:05	6		14.82							C	0.07	597.0	
4295	6/14/2018 5:21	6		15.02	14.11	0.35					U	0.33	1298.3	7.38
4296	6/14/2018 5:38	6		15.96	9.40	-0.04					U	0.12	1166.1	
4297	6/14/2018 5:55	6		16.55	16.72						U	0.09	1005.1	0.63
4298	6/14/2018 6:11	6		17.01							U	0.15	948.5	0.86
4299	6/14/2018 8:15	6		19.58	16.85	0.28					C	0.04	1973.5	
4300	6/14/2018 8:32	6		20.92		0.25					C	0.10	903.7	
4301	6/14/2018 8:48	6		20.73							C	0.09	2198.9	
4302	6/14/2018 9:05	6		21.17							C	0.09	1023.4	
4303	6/14/2018 9:21	6		22.43	17.27	0.35					U	0.16	1642.2	6.65
4304	6/14/2018 9:38	6		23.77	13.44	-0.04					U	0.42	1534.2	
4305	6/14/2018 9:54	6		24.34	20.93						U	0.12	1186.2	1.08
4306	6/14/2018 10:11	6		25.24							U	0.15	1077.9	0.85
4307	6/14/2018 12:15	6		29.32	20.30	0.29					C	0.07	1718.0	
4308	6/14/2018 12:32	6		27.58		0.25					C	0.09	1270.1	
4309	6/14/2018 12:48	6		26.62							C	0.03	2388.8	
4310	6/14/2018 13:05	6		29.07							C	0.15	1806.0	
4311	6/14/2018 13:21	6		31.04	22.92	0.35					U	0.08	1328.6	4.17
4312	6/14/2018 13:38	6		32.72	19.72	-0.04					U	0.10	2026.1	
4313	6/14/2018 13:54	6		33.28	27.87						U	0.15	1174.5	0.55
4314	6/14/2018 14:11	6		32.61							U	0.11	909.0	0.71
4315	6/14/2018 16:15	6		31.22	23.22	0.29					C	0.02	1534.5	
4316	6/14/2018 16:32	6		34.27		0.25					C	0.09	1038.6	
4317	6/14/2018 16:48	6		30.35							C	0.02	2005.4	
4318	6/14/2018 17:05	6		30.04							C	0.23	2323.5	
4319	6/14/2018 17:21	6		30.91	25.24	0.35					U	0.03	802.9	1.23
4320	6/14/2018 17:38	6		32.13	20.98	-0.05					U	0.15	2229.5	
4321	6/14/2018 17:54	6		31.32	29.16						U	0.10	941.2	0.14
4322	6/14/2018 18:11	6		30.95							U	0.06	756.2	0.01
4323	6/14/2018 20:15	6		28.02	22.55	0.28					C		1715.4	
4324	6/14/2018 20:32	6		27.66		0.25					C	0.10	974.9	
4325	6/14/2018 20:48	6		26.45							C	0.04	1757.7	
4326	6/14/2018 21:05	6		25.87							C	0.08	1517.3	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4327	6/14/2018 21:21	6		25.14		22.32		0.34			U	0.08	937.3	0.48
4328	6/14/2018 21:38	6		25.00		17.52		-0.04			U	0.05	1310.5	
4329	6/14/2018 21:54	6		24.33		25.16					U	0.06	645.8	0.03
4330	6/14/2018 22:11	6		24.08							U	0.11	847.4	0.10
4331	6/15/2018 0:15	6		22.83		21.24		0.27			C		1203.8	
4332	6/15/2018 0:32	6		22.61				0.25			C	0.06	1036.8	
4333	6/15/2018 0:48	6		22.57							C	0.04	1675.4	
4334	6/15/2018 1:05	6		22.67							C	0.12	1131.7	
4335	6/15/2018 1:22	6		22.50		20.03		0.34			U	0.09	1133.1	0.48
4336	6/15/2018 1:38	6		22.63		15.26		-0.04			U	0.07	1767.8	
4337	6/15/2018 1:55	6		22.65		22.77					U	0.05	836.7	0.12
4338	6/15/2018 2:11	6		22.84							U	0.09	922.3	0.18
4339	6/15/2018 4:15	6		22.41		20.71		0.27			C	0.02	2000.4	
4340	6/15/2018 4:32	6		22.16				0.24			C	0.09	837.5	
4341	6/15/2018 4:48	6		22.29							C	0.02	1709.4	
4342	6/15/2018 5:05	6		22.32							C	0.04	1088.4	
4343	6/15/2018 5:21	6		22.25		19.24		0.34			U	0.13	1194.4	1.25
4344	6/15/2018 5:38	6		22.07		14.32		-0.04			U	0.01	889.6	
4345	6/15/2018 5:55	6		21.69		21.64					U	0.04	871.3	0.38
4346	6/15/2018 6:11	6		21.31							U	0.13	1055.1	1.18
4347	6/15/2018 8:15	6		25.71		20.68		0.27			C	0.02	1201.4	
4348	6/15/2018 8:32	6		27.09				0.24			C	0.08	1156.5	
4349	6/15/2018 8:48	6		27.70							C	0.04	1248.8	
4350	6/15/2018 9:05	6		26.97							C	0.03	676.5	
4351	6/15/2018 9:21	6		25.82		20.81		0.34			U	0.10	788.9	1.87
4352	6/15/2018 9:38	6		25.32		16.44		-0.04			U	0.04	372.9	
4353	6/15/2018 9:54	6		24.87		23.47					U	0.07	491.1	0.38
4354	6/15/2018 10:11	6		26.76							U	0.20	756.9	0.82
4355	6/15/2018 12:15	6		33.02		22.21		0.27			C	0.07	1491.5	
4356	6/15/2018 12:32	6		34.02				0.25			C	0.05	762.3	
4357	6/15/2018 12:48	6		33.21							C	0.01	941.9	
4358	6/15/2018 13:05	6		32.46							C	0.03	554.0	
4359	6/15/2018 13:21	6		31.90		25.19		0.34			U	0.07	509.0	1.09
4360	6/15/2018 13:38	6		34.19		21.70		-0.04			U	0.01	473.4	
4361	6/15/2018 13:54	6		34.24		29.14					U	0.08	458.5	0.12
4362	6/15/2018 14:11	6		34.88							U	0.28	678.8	0.32
4363	6/15/2018 16:15	6		36.75		24.21		0.27			C		1525.5	
4364	6/15/2018 16:32	6		37.90				0.25			C	0.06	847.6	
4365	6/15/2018 16:48	6		37.65							C		1263.6	
4366	6/15/2018 17:05	6		38.50							C	0.06	622.3	
4367	6/15/2018 17:21	6		38.38		28.79		0.34			U	0.10	572.1	0.92
4368	6/15/2018 17:38	6		37.87		25.01		-0.05			U	0.03	251.8	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4369	6/15/2018 17:54	6		37.42		32.61					U	0.06	494.2	0.04
4370	6/15/2018 18:11	6		35.66							U	0.33	735.3	0.24
4371	6/15/2018 20:15	6		29.85		24.48		0.27			C		1377.9	
4372	6/15/2018 20:32	6		30.11				0.25			C	0.06	843.9	
4373	6/15/2018 20:48	6		28.56							C	0.01	944.4	
4374	6/15/2018 21:05	6		27.98							C	0.06	746.4	
4375	6/15/2018 21:21	6		26.33		24.82		0.34			U	0.09	670.8	0.49
4376	6/15/2018 21:38	6		25.13		20.04		-0.04			U	0.05	559.1	
4377	6/15/2018 21:55	6		24.24		27.42					U	0.08	468.8	0.06
4378	6/15/2018 22:11	6		23.39							U	0.31	732.1	0.08
4379	6/16/2018 0:15	6		24.46		22.63		0.26			C		1830.3	
4380	6/16/2018 0:32	6		24.48				0.24			C	0.02	798.0	
4381	6/16/2018 0:49	6		24.52							C	0.04	1578.0	
4382	6/16/2018 1:05	6		24.93							C	0.01	858.7	
4383	6/16/2018 1:22	6		24.95		21.96		0.33			U	0.05	1030.6	0.32
4384	6/16/2018 1:38	6		25.08		17.20		-0.04			U	0.02	1155.5	
4385	6/16/2018 1:55	6		24.81		24.72					U	0.09	638.9	0.01
4386	6/16/2018 2:11	6		24.68							U	0.58	838.2	0.18
4387	6/16/2018 4:15	6		23.45		22.01		0.26			C	0.04	1459.4	
4388	6/16/2018 4:32	6		23.69				0.24			C	0.10	981.9	
4389	6/16/2018 4:48	6		23.42							C	0.03	1613.3	
4390	6/16/2018 5:05	6		23.56							C	0.05	857.9	
4391	6/16/2018 5:21	6		23.75		20.91		0.33			U	0.09	988.6	0.28
4392	6/16/2018 5:38	6		23.98		16.07		-0.04			U	0.03	631.3	
4393	6/16/2018 5:54	6		23.93		23.54					U	0.08	556.6	0.01
4394	6/16/2018 6:11	6		23.60							U	0.33	776.5	0.07
4395	6/16/2018 8:15	6		23.25		21.70		0.26			C		1626.8	
4396	6/16/2018 8:32	6		24.13				0.24			C	0.06	1131.5	
4397	6/16/2018 8:48	6		24.73							C		1796.9	
4398	6/16/2018 9:05	6		25.20							C	0.08	1076.4	
4399	6/16/2018 9:21	6		25.19		21.32		0.33			U	0.23	1196.8	2.31
4400	6/16/2018 9:38	6		26.46		16.48		-0.04			U	0.07	1111.0	
4401	6/16/2018 9:55	6		26.86		24.22					U	0.05	958.2	0.55
4402	6/16/2018 10:11	6		25.92							U	0.24	1085.5	1.91
4403	6/16/2018 12:15	6		31.81		23.68		0.26			C	0.05	1506.7	
4404	6/16/2018 12:32	6		35.04				0.24			C	0.15	1120.8	
4405	6/16/2018 12:48	6		35.54							C	0.03	1678.6	
4406	6/16/2018 13:05	6		34.21							C	0.06	1186.6	
4407	6/16/2018 13:21	6		35.20		27.60		0.34			U	0.09	939.1	1.00
4408	6/16/2018 13:38	6		34.63		23.39		-0.05			U	0.05	1452.7	
4409	6/16/2018 13:54	6		37.90		31.84					U	0.11	682.1	0.16
4410	6/16/2018 14:11	6		38.18							U	0.50	849.7	0.07

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4411	6/16/2018 16:15	6		37.72		27.01		0.26			C	0.03	1623.5	
4412	6/16/2018 16:32	6		36.09				0.25			C	0.09	1178.9	
4413	6/16/2018 16:48	6		36.70							C		2032.0	
4414	6/16/2018 17:05	6		35.95							C	0.14	1807.6	
4415	6/16/2018 17:21	6		36.42		30.18		0.34			U	0.02	787.6	0.33
4416	6/16/2018 17:38	6		33.82		25.35		-0.04			U	0.06	620.5	
4417	6/16/2018 17:54	6		33.08		32.95					U	0.08	592.5	0.01
4418	6/16/2018 18:11	6		33.47							U	0.41	1107.8	0.20
4419	6/16/2018 20:15	6		30.68		25.49		0.26			C		1297.3	
4420	6/16/2018 20:32	6		30.43				0.24			C	0.04	1115.0	
4421	6/16/2018 20:48	6		29.68							C		1517.1	
4422	6/16/2018 21:05	6		29.72							C	0.09	1086.8	
4423	6/16/2018 21:21	6		29.19		25.84		0.33			U		749.8	0.18
4424	6/16/2018 21:38	6		29.05		20.98		-0.04			U	0.01	590.7	0.01
4425	6/16/2018 21:54	6		28.60		28.62					U	0.06	620.1	0.05
4426	6/16/2018 22:11	6		28.03							U	0.23	918.5	0.08
4427	6/17/2018 0:15	6		26.66		24.08		0.25			C	0.01	1854.4	
4428	6/17/2018 0:32	6		26.63				0.24			C	0.03	969.9	
4429	6/17/2018 0:48	6		26.17							C	0.02	962.0	
4430	6/17/2018 1:05	6		26.73							C	0.02	750.2	
4431	6/17/2018 1:22	6		26.25		23.47		0.33			U	0.09	671.6	0.14
4432	6/17/2018 1:38	6		25.48		18.59		-0.04			U	0.03	796.3	0.02
4433	6/17/2018 1:55	6		24.66		26.11					U	0.06	642.5	
4434	6/17/2018 2:11	6		25.02							U	0.20	838.0	0.05
4435	6/17/2018 4:15	6		24.59		23.13		0.25			C	0.05	1285.1	
4436	6/17/2018 4:32	6		24.60				0.24			C	0.04	786.4	
4437	6/17/2018 4:48	6		24.16							C	0.01	1133.5	
4438	6/17/2018 5:05	6		24.63							C	0.02	789.1	
4439	6/17/2018 5:21	6		24.72		22.13		0.33			U	0.05	967.6	0.13
4440	6/17/2018 5:38	6		23.83		17.21		-0.04			U	0.05	684.9	
4441	6/17/2018 5:55	6		23.34		24.66					U	0.10	668.1	0.05
4442	6/17/2018 6:11	6		23.22							U	0.11	874.3	0.01
4443	6/17/2018 8:15	6		25.26		22.86		0.25			C	0.04	1436.3	
4444	6/17/2018 8:32	6		25.58				0.23			C	0.06	842.1	
4445	6/17/2018 8:48	6		25.30							C		1230.8	
4446	6/17/2018 9:05	6		25.75							C	0.01	802.1	
4447	6/17/2018 9:21	6		26.06		22.54		0.33			U	0.10	840.3	0.18
4448	6/17/2018 9:38	6		26.48		17.84		-0.04			U	0.09	719.2	0.05
4449	6/17/2018 9:54	6		25.20		25.57					U	0.03	1606.1	0.06
4450	6/17/2018 10:11	6		25.49							U	0.18	1813.8	
4451	6/17/2018 12:15	6		29.20		23.91		0.27			C	0.01	1659.5	
4452	6/17/2018 12:32	6		29.61				0.22			C	0.57	1516.8	0.01

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4453	6/17/2018 12:48	6		31.47							C	0.06	1923.3	
4454	6/17/2018 13:05	6		32.79							C	0.47	1458.6	
4455	6/17/2018 13:21	6		30.79	26.85	0.34					U	0.09	2812.9	4.37
4456	6/17/2018 13:38	6		31.86	22.24	-0.04					U	0.02	2995.8	
4457	6/17/2018 13:55	6		32.17	29.98						U	0.13	2684.7	2.12
4458	6/17/2018 14:11	6		33.14							U	0.34	2957.9	3.87
4459	6/17/2018 16:15	6		33.42	25.98	0.27					C		1845.4	
4460	6/17/2018 16:32	6		31.87		0.23					C	0.07	1134.3	
4461	6/17/2018 16:48	6		30.76							C		1626.8	
4462	6/17/2018 17:05	6		27.58							C	0.05	1259.0	
4463	6/17/2018 17:21	6		25.56	26.06	0.34					U	0.13	2015.9	4.92
4464	6/17/2018 17:38	6		24.42	20.88	-0.04					U	0.11	2395.0	
4465	6/17/2018 17:54	6		25.14	27.92						U	0.05	1639.3	0.92
4466	6/17/2018 18:11	6		23.56							U	0.25	1749.4	1.36
4467	6/17/2018 20:15	6		21.32	23.23	0.26					C		2041.0	
4468	6/17/2018 20:32	6		20.74		0.24					C	0.07	981.3	
4469	6/17/2018 20:48	6		20.61							C	0.04	1742.9	
4470	6/17/2018 21:05	6		19.87							C	0.06	1289.7	
4471	6/17/2018 21:21	6		19.68	21.07	0.33					U	0.18	1866.5	2.72
4472	6/17/2018 21:38	6		19.28	15.74	-0.04					U	0.11	2560.0	
4473	6/17/2018 21:55	6		18.97	23.00						U	0.08	1470.3	0.75
4474	6/17/2018 22:11	6		18.74							U	0.18	1677.1	0.65
4475	6/18/2018 0:15	6		18.91	21.22	0.26					C	0.04	1895.3	
4476	6/18/2018 0:32	6		19.06		0.23					C	0.12	743.9	
4477	6/18/2018 0:49	6		19.01							C	0.04	1601.9	
4478	6/18/2018 1:05	6		18.98							C	0.11	1040.5	
4479	6/18/2018 1:22	6		19.15	19.10	0.33					U	0.13	1706.6	4.63
4480	6/18/2018 1:38	6		19.17	13.88	-0.04					U	0.12	1911.2	
4481	6/18/2018 1:55	6		19.06	21.30						U	0.06	1368.2	1.28
4482	6/18/2018 2:11	6		19.00							U	0.20	1611.1	1.59
4483	6/18/2018 4:15	6		18.77	20.51	0.26					C	0.06	1821.7	
4484	6/18/2018 4:32	6		18.75		0.25					C	0.03	937.5	
4485	6/18/2018 4:48	6		18.83							C	0.08	1904.6	
4486	6/18/2018 5:05	6		18.62							C	0.05	1112.6	
4487	6/18/2018 5:22	6		18.59	18.36	0.33					U	0.12	1715.9	5.00
4488	6/18/2018 5:38	6		18.51	13.03	-0.04					U	0.13	1836.8	
4489	6/18/2018 5:55	6		18.30	20.40						U	0.11	1515.9	1.00
4490	6/18/2018 6:11	6		18.14							U	0.18	1705.3	2.01
4491	6/18/2018 8:15	6		18.18	19.89	0.26					C	0.08	2941.0	
4492	6/18/2018 8:32	6		18.29		0.25					C	0.04	841.4	
4493	6/18/2018 8:48	6		18.42							C	0.01	1406.8	
4494	6/18/2018 9:05	6		18.21							C	0.04	1064.0	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4495	6/18/2018 9:21	6		18.67		17.98		0.34			U	0.16	1741.3	6.10
4496	6/18/2018 9:38	6		18.88		12.70		-0.04			U	0.26	2325.5	
4497	6/18/2018 9:54	6		18.45		20.15					U	0.11	1474.8	1.42
4498	6/18/2018 10:11	6		18.44							U	0.18	1714.0	2.87
4499	6/18/2018 12:15	6		20.85		19.98		0.27			C	0.04	3055.7	
4500	6/18/2018 12:32	6		22.07				0.22			C	0.05	813.6	
4501	6/18/2018 12:48	6		23.41							C	0.05	1528.0	
4502	6/18/2018 13:05	6		23.90							C	0.08	955.6	
4503	6/18/2018 13:21	6		24.27		20.30		0.34			U	0.16	2135.4	12.64
4504	6/18/2018 13:38	6		25.17		15.22		-0.04			U	0.18	3031.1	3.44
4505	6/18/2018 13:54	6		24.50		22.81					U	0.13	2056.5	4.09
4506	6/18/2018 14:11	6		22.70							U	0.31	1532.8	5.73
4507	6/18/2018 16:15	6		24.69		21.12		0.27			C	0.08	3165.3	
4508	6/18/2018 16:32	6		25.47				0.22			C	0.05	888.6	
4509	6/18/2018 16:48	6		24.76							C	0.02	1207.0	
4510	6/18/2018 17:05	6		24.31							C	0.10	904.6	
4511	6/18/2018 17:21	6		23.74		21.20		0.34			U	0.16	1691.0	13.91
4512	6/18/2018 17:38	6		22.86		15.83		-0.04			U	0.18	2017.6	3.36
4513	6/18/2018 17:54	6		22.67		23.01					U	0.09	1416.6	3.18
4514	6/18/2018 18:11	6		22.94							U	0.49	1443.9	2.32
4515	6/18/2018 20:15	6		21.77		20.90		0.27			C	0.06	2106.3	
4516	6/18/2018 20:32	6		21.55				0.22			C	0.05	716.0	
4517	6/18/2018 20:48	6		21.26							C		1078.0	
4518	6/18/2018 21:05	6		21.13							C	0.02	832.2	
4519	6/18/2018 21:21	6		20.81		19.40		0.34			U	0.15	1296.4	8.39
4520	6/18/2018 21:38	6		20.63		14.09		-0.04			U	0.23	1825.1	1.67
4521	6/18/2018 21:54	6		20.47		21.36					U	0.12	1238.4	1.40
4522	6/18/2018 22:11	6		20.37							U	0.15	1144.7	1.30
4523	6/19/2018 0:15	6		19.09		20.02		0.27			C	0.08	1663.2	
4524	6/19/2018 0:32	6		18.59				0.40			C	0.02	80.8	
4525	6/19/2018 0:48	6		18.56							C	0.04	897.9	
4526	6/19/2018 1:05	6		18.56							C		276.8	
4527	6/19/2018 1:22	6		18.69		17.54		0.39			U	0.22	586.6	1.47
4528	6/19/2018 1:38	6		18.70		12.09		-0.04			U	0.07	326.0	
4529	6/19/2018 1:55	6		18.66		19.76					U	0.10	393.0	
4530	6/19/2018 2:11	6		18.69							U	0.33	417.4	
4531	6/19/2018 4:15	6		18.37		19.41		0.36			C		400.4	
4532	6/19/2018 4:32	6		18.01				0.33			C	0.09	621.3	
4533	6/19/2018 4:48	6		18.08							C	0.02	871.9	
4534	6/19/2018 5:05	6		17.78							C	0.08	658.3	
4535	6/19/2018 5:21	6		17.65		17.05		0.38			U	0.17	985.9	1.47
4536	6/19/2018 5:38	6		17.62		11.66		0.56			U	0.07	797.7	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4537	6/19/2018 5:54	6		17.57		19.05					U	0.08	697.2	0.10
4538	6/19/2018 6:11	6		17.61							U	0.21	699.2	0.28
4539	6/19/2018 8:15	6		17.89		18.89		0.36			C	0.03	588.1	
4540	6/19/2018 8:32	6		17.82				0.34			C	0.04	582.3	
4541	6/19/2018 8:48	6		18.67							C	0.04	1151.5	
4542	6/19/2018 9:05	6		18.15							C	0.09	720.0	
4543	6/19/2018 9:21	6		18.59		17.29		0.38			U	0.23	1346.3	1.54
4544	6/19/2018 9:38	6		19.15		12.08		0.48			U	0.15	1629.1	0.16
4545	6/19/2018 9:55	6		19.51		19.69					U	0.08	927.3	0.33
4546	6/19/2018 10:11	6		20.01							U	0.17	864.6	0.64
4547	6/19/2018 12:15	6		20.49		19.48		0.37			C	0.04	933.4	
4548	6/19/2018 12:32	6		20.94				0.31			C	0.10	778.2	
4549	6/19/2018 12:48	6		22.25							C	0.03	1355.8	
4550	6/19/2018 13:05	6		21.78							C	0.13	791.7	
4551	6/19/2018 13:21	6		21.38		19.18		0.38			U	0.35	1735.7	2.92
4552	6/19/2018 13:38	6		21.35		13.63		0.41			U	0.14	1890.2	0.49
4553	6/19/2018 13:54	6		21.51		21.21					U	0.14	1355.2	1.11
4554	6/19/2018 14:11	6		21.67							U	0.25	1043.3	0.46
4555	6/19/2018 16:15	6		22.63		20.09		0.37			C	0.04	1621.7	
4556	6/19/2018 16:32	6		21.56				0.30			C	0.11	911.3	
4557	6/19/2018 16:48	6		22.11							C	0.10	1653.7	
4558	6/19/2018 17:05	6		21.45							C	0.11	908.2	
4559	6/19/2018 17:21	6		21.76		19.70		0.37			U	0.28	1651.4	3.13
4560	6/19/2018 17:38	6		21.42		14.07		0.26			U	0.17	1679.7	
4561	6/19/2018 17:54	6		21.92		21.61					U	0.13	1362.9	1.34
4562	6/19/2018 18:11	6		21.81							U	0.29	1244.8	
4563	6/19/2018 20:15	6		18.78		19.93		0.36			C	0.05	1727.3	
4564	6/19/2018 20:32	6		18.37				0.29			C	0.13	853.5	
4565	6/19/2018 20:48	6		18.61							C	0.05	1421.0	
4566	6/19/2018 21:05	6		18.02							C	0.09	785.1	
4567	6/19/2018 21:21	6		17.88		17.78		0.37			U	0.32	1139.5	1.34
4568	6/19/2018 21:38	6		17.67		12.14		0.25			U	0.13	1067.3	
4569	6/19/2018 21:55	6		17.12		19.38					U	0.13	924.3	0.26
4570	6/19/2018 22:11	6		17.13							U	0.22	931.0	
4571	6/20/2018 0:15	6		16.97		19.01		0.36			C	0.06	1384.6	
4572	6/20/2018 0:32	6		16.85				0.29			C	0.08	857.6	
4573	6/20/2018 0:48	6		17.01							C	0.05	1192.2	
4574	6/20/2018 1:05	6		16.71							C	0.07	733.4	
4575	6/20/2018 1:22	6		16.80		16.30		0.37			U	0.24	1033.6	0.96
4576	6/20/2018 1:38	6		16.70		10.76		0.23			U	0.13	1039.3	0.27
4577	6/20/2018 1:55	6		16.68		18.14					U	0.14	923.1	0.79
4578	6/20/2018 2:11	6		16.71							U	0.20	927.5	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4579	6/20/2018 4:15	6		16.94		18.51		0.36			C	0.08	1197.4	
4580	6/20/2018 4:32	6		16.74				0.29			C	0.09	814.0	
4581	6/20/2018 4:48	6		16.90							C	0.06	1176.4	
4582	6/20/2018 5:05	6		16.55							C	0.11	720.1	
4583	6/20/2018 5:21	6		16.64		15.86		0.37			U	0.29	918.8	1.54
4584	6/20/2018 5:38	6		16.60		10.37		0.12			U	0.13	976.1	0.35
4585	6/20/2018 5:54	6		16.49		17.68					U	0.14	785.1	0.66
4586	6/20/2018 6:11	6		16.50							U	0.22	853.6	
4587	6/20/2018 8:15	6		17.53		18.15		0.36			C	0.06	1374.3	
4588	6/20/2018 8:32	6		17.67				0.28			C	0.13	757.5	
4589	6/20/2018 8:48	6		18.19							C	0.04	1183.1	
4590	6/20/2018 9:05	6		17.93							C	0.07	710.2	
4591	6/20/2018 9:21	6		17.91		16.19		0.37			U	0.31	1047.0	1.09
4592	6/20/2018 9:38	6		18.69		10.80		0.14			U	0.24	1100.2	0.60
4593	6/20/2018 9:54	6		18.85		18.30					U	0.10	959.0	0.91
4594	6/20/2018 10:11	6		18.88							U	0.17	999.3	0.35
4595	6/20/2018 12:15	6		17.95		18.23		0.36			C	0.07	10516.1	
4596	6/20/2018 12:32	6		18.09				0.32			C	0.12	668.5	
4597	6/20/2018 12:48	6		18.79							C	0.14	2175.2	
4598	6/20/2018 13:05	6		18.65							C	0.05	601.1	
4599	6/20/2018 13:21	6		18.78		17.26		0.38			U	0.35	547.5	0.35
4600	6/20/2018 13:38	6		19.38		11.95		0.12			U	0.13	595.7	0.29
4601	6/20/2018 13:54	6		20.15		19.67					U	0.27	633.8	0.28
4602	6/20/2018 14:11	6		20.71							U	0.18	538.0	
4603	6/20/2018 16:15	6		20.31		19.09		0.38			C	0.04	787.3	
4604	6/20/2018 16:32	6		19.72				0.30			C	0.13	806.7	
4605	6/20/2018 16:48	6		19.43							C	0.04	1320.5	
4606	6/20/2018 17:05	6		19.12							C	0.09	804.6	
4607	6/20/2018 17:21	6		19.17		18.12		0.38			U	0.46	833.5	0.41
4608	6/20/2018 17:38	6		19.13		12.60		0.15			U	0.17	1075.3	0.06
4609	6/20/2018 17:54	6		19.01		19.87					U	0.14	592.4	0.29
4610	6/20/2018 18:11	6		18.87							U	0.12	557.4	
4611	6/20/2018 20:15	6		17.14		18.70		0.38			C	0.06	512.4	
4612	6/20/2018 20:32	6		16.97				0.35			C	0.11	518.4	
4613	6/20/2018 20:48	6		16.79							C	0.07	2470.5	
4614	6/20/2018 21:05	6		15.99							C	0.04	711.6	
4615	6/20/2018 21:21	6		16.73		16.09		0.39			U	0.19	646.8	0.14
4616	6/20/2018 21:38	6		16.87		10.61		0.13			U	0.10	579.7	0.06
4617	6/20/2018 21:54	6		16.82		17.88					U	0.10	541.0	0.15
4618	6/20/2018 22:11	6		16.84							U	0.19	547.3	
4619	6/21/2018 0:15	6		16.20		17.86		0.39			C	0.01	202.9	
4620	6/21/2018 0:32	6		15.95				0.37			C	0.09	487.8	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4621	6/21/2018 0:48	6		16.01							C	0.05	639.8	
4622	6/21/2018 1:05	6		15.91							C	0.07	738.5	
4623	6/21/2018 1:21	6		16.08	15.12	0.40					U	0.18	515.0	0.06
4624	6/21/2018 1:38	6		16.15	9.71	0.12					U	0.12	620.4	0.24
4625	6/21/2018 1:54	6		16.21	16.94						U	0.04	435.2	0.15
4626	6/21/2018 2:11	6		16.35							U	0.10	307.4	0.03
4627	6/21/2018 4:15	6		16.31	17.47	0.40					C	0.02	185.5	
4628	6/21/2018 4:32	6		15.99		0.37					C	0.03	177.4	
4629	6/21/2018 4:48	6		16.16							C	0.02	410.9	
4630	6/21/2018 5:05	6		16.11							C	0.04	456.9	
4631	6/21/2018 5:21	6		16.33	14.90	0.42					U	0.03	342.3	0.03
4632	6/21/2018 5:38	6		16.33	9.51	0.13					U	0.05	282.1	0.15
4633	6/21/2018 5:55	6		16.24	16.78						U	0.03	398.5	0.14
4634	6/21/2018 6:11	6		16.25							U	0.15	201.6	0.09
4635	6/21/2018 8:15	6		17.73	17.36	0.41					C	0.03	265.0	
4636	6/21/2018 8:32	6		17.87		0.35					C	0.13	521.5	
4637	6/21/2018 8:48	6		18.40							C	0.22	3537.9	
4638	6/21/2018 9:05	6		18.69							C	0.06	724.2	
4639	6/21/2018 9:21	6		18.93	16.39	0.40					U	0.27	739.3	0.05
4640	6/21/2018 9:38	6		18.95	11.07	0.15					U	0.07	965.7	0.27
4641	6/21/2018 9:54	6		18.74	18.40						U	0.12	658.2	0.12
4642	6/21/2018 10:11	6		18.80							U	0.20	473.8	1.17
4643	6/21/2018 12:15	6		23.45	18.36	0.40					C	0.10	415.7	
4644	6/21/2018 12:32	6		23.32		0.32					C	0.26	847.6	
4645	6/21/2018 12:48	6		24.46							C	0.07	1232.7	
4646	6/21/2018 13:05	6		23.85							C	0.08	850.3	
4647	6/21/2018 13:21	6		23.07	19.76	0.39					U	0.49	1204.0	0.34
4648	6/21/2018 13:38	6		23.76	14.15	0.18					U	0.17	1153.8	0.22
4649	6/21/2018 13:54	6		23.49	21.60						U	0.20	981.8	0.19
4650	6/21/2018 14:11	6		23.52							U	0.36	827.2	0.21
4651	6/21/2018 16:15	6		26.10	19.99	0.40					C	0.04	726.4	
4652	6/21/2018 16:32	6		26.46		0.31					C	0.17	937.3	
4653	6/21/2018 16:48	6		27.08							C	0.11	1489.7	
4654	6/21/2018 17:05	6		26.45							C	0.13	1078.6	
4655	6/21/2018 17:21	6		25.86	21.61	0.39					U	0.72	1663.3	0.50
4656	6/21/2018 17:38	6		26.29	15.48	0.16					U	0.58	1506.1	0.73
4657	6/21/2018 17:54	6		26.64	23.55						U	0.37	1383.5	0.54
4658	6/21/2018 18:11	6		26.71							U	0.73	1411.4	0.10
4659	6/21/2018 20:15	6		21.03	20.21	0.40					C	0.05	884.8	
4660	6/21/2018 20:32	6		21.02		0.29					C	0.19	1115.4	
4661	6/21/2018 20:48	6		20.28							C	0.12	1457.5	
4662	6/21/2018 21:05	6		19.41							C	0.13	1057.4	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4663	6/21/2018 21:21	6		18.67		18.87		0.38			U	0.62	974.2	0.34
4664	6/21/2018 21:38	6		18.29		13.01		0.07			U	0.39	782.4	0.10
4665	6/21/2018 21:54	6		17.95		20.43					U	0.31	779.1	0.22
4666	6/21/2018 22:11	6		17.73							U	0.45	870.2	
4667	6/22/2018 0:15	6		16.69		18.99		0.40			C	0.10	736.5	
4668	6/22/2018 0:32	6		16.31				0.29			C	0.13	796.1	
4669	6/22/2018 0:49	6		16.78							C	0.11	1323.4	
4670	6/22/2018 1:05	6		16.43							C	0.16	895.4	
4671	6/22/2018 1:22	6		16.42		16.45		0.38			U	0.39	829.9	0.16
4672	6/22/2018 1:38	6		16.35		10.80		0.06			U	0.41	673.7	0.31
4673	6/22/2018 1:55	6		16.24		18.28					U	0.24	749.4	0.24
4674	6/22/2018 2:11	6		16.15							U	0.34	771.6	
4675	6/22/2018 4:15	6		15.41		18.22		0.40			C	0.07	733.3	
4676	6/22/2018 4:32	6		15.11				0.29			C	0.14	761.0	
4677	6/22/2018 4:48	6		15.29							C	0.07	1156.9	
4678	6/22/2018 5:05	6		15.06							C	0.11	754.5	
4679	6/22/2018 5:21	6		15.63		15.26		0.38			U	0.37	800.3	0.13
4680	6/22/2018 5:38	6		15.55		9.71		0.06			U	0.24	606.0	0.36
4681	6/22/2018 5:54	6		14.86		17.07					U	0.23	671.8	0.19
4682	6/22/2018 6:11	6		14.67							U	0.29	660.6	
4683	6/22/2018 8:15	6		17.72		17.93		0.40			C	0.07	753.9	
4684	6/22/2018 8:32	6		18.33				0.29			C	0.17	879.4	
4685	6/22/2018 8:48	6		19.80							C	0.06	1360.5	
4686	6/22/2018 9:05	6		19.76							C	0.14	928.9	0.01
4687	6/22/2018 9:21	6		19.69		17.21		0.39			U	0.75	904.0	0.08
4688	6/22/2018 9:38	6		20.78		12.18		0.09			U	0.19	629.3	0.36
4689	6/22/2018 9:54	6		22.33		19.88					U	0.27	792.4	0.38
4690	6/22/2018 10:11	6		24.76							U	0.53	1021.8	22.67
4691	6/22/2018 12:15	6		29.53		20.43		0.40			C	0.09	1409.7	
4692	6/22/2018 12:32	6		26.63				0.30			C	0.29	1546.4	
4693	6/22/2018 12:48	6		29.98							C	0.10	2060.2	
4694	6/22/2018 13:05	6		28.24							C	0.16	1207.4	
4695	6/22/2018 13:21	6		28.99		23.57		0.39			U	1.03	1449.9	0.82
4696	6/22/2018 13:38	6		29.59		18.57		0.22			U	0.72	1524.5	1.04
4697	6/22/2018 13:54	6		29.07		25.76					U	0.61	1657.4	0.42
4698	6/22/2018 14:11	6		30.35							U	1.49	1709.5	0.09
4699	6/22/2018 16:15	6		32.82		23.32		0.39			C	0.18	2443.4	
4700	6/22/2018 16:32	6		29.05				0.29			C	0.20	1390.6	
4701	6/22/2018 16:48	6		28.50							C	0.17	2162.4	
4702	6/22/2018 17:05	6		30.65							C	0.43	1603.2	
4703	6/22/2018 17:21	6		31.16		25.66		0.38			U	0.92	1520.4	1.46
4704	6/22/2018 17:38	6		29.50		19.97		0.26			U	0.48	1578.2	0.26

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4705	6/22/2018 17:54	6		30.73		28.45					U	0.59	1341.4	0.17
4706	6/22/2018 18:11	6		30.07							U	1.39	1379.3	0.16
4707	6/22/2018 20:15	6		22.25		22.16		0.39			C	0.11	1917.0	
4708	6/22/2018 20:32	6		23.43				0.28			C	0.09	1049.7	
4709	6/22/2018 20:48	6		21.25							C	0.08	1771.1	
4710	6/22/2018 21:05	6		20.63							C	0.11	1270.9	
4711	6/22/2018 21:21	6		19.88		20.67		0.37			U	0.41	998.3	0.64
4712	6/22/2018 21:38	6		19.13		14.51		0.12			U	0.32	970.1	
4713	6/22/2018 21:54	6		18.66		22.51					U	0.30	861.0	0.11
4714	6/22/2018 22:11	6		18.09							U	0.48	924.1	
4715	6/23/2018 0:15	6		16.50		20.19		0.39			C	0.06	1433.8	
4716	6/23/2018 0:32	6		15.99				0.27			C	0.11	845.9	
4717	6/23/2018 0:48	6		15.76							C	0.08	1305.8	
4718	6/23/2018 1:05	6		15.41							C	0.10	928.3	
4719	6/23/2018 1:21	6		15.29		17.16		0.37			U	0.33	745.7	0.13
4720	6/23/2018 1:38	6		14.96		11.30		0.09			U	0.30	533.0	0.06
4721	6/23/2018 1:54	6		15.10		18.98					U	0.25	485.3	0.09
4722	6/23/2018 2:11	6		15.12							U	0.31	1009.5	
4723	6/23/2018 4:15	6		13.97		18.77		0.39			C	0.10	1352.3	
4724	6/23/2018 4:32	6		13.49				0.27			C	0.08	662.5	
4725	6/23/2018 4:48	6		13.78							C	0.12	1158.8	
4726	6/23/2018 5:05	6		13.42							C	0.09	949.8	
4727	6/23/2018 5:21	6		13.66		15.05		0.37			U	0.26	1020.0	0.06
4728	6/23/2018 5:38	6		13.45		9.29		0.06			U	0.27	713.5	0.06
4729	6/23/2018 5:55	6		13.46		16.90					U	0.20	701.8	0.08
4730	6/23/2018 6:11	6		13.65							U	0.27	800.9	
4731	6/23/2018 8:15	6		17.26		18.28		0.39			C	0.10	1593.2	
4732	6/23/2018 8:32	6		18.30				0.27			C	0.09	815.0	
4733	6/23/2018 8:48	6		18.96							C	0.05	1478.3	
4734	6/23/2018 9:05	6		20.49							C	0.24	973.2	0.07
4735	6/23/2018 9:21	6		21.36		18.03		0.37			U	0.36	1131.9	0.09
4736	6/23/2018 9:38	6		22.76		13.26		0.09			U	0.20	976.3	0.36
4737	6/23/2018 9:54	6		23.06		20.96					U	0.26	923.5	0.30
4738	6/23/2018 10:11	6		23.37							U	0.46	888.8	4.93
4739	6/23/2018 12:15	6		26.46		20.22		0.39			C	0.17	2401.7	
4740	6/23/2018 12:32	6		27.76				0.27			C	0.09	1089.5	
4741	6/23/2018 12:48	6		26.28							C	0.07	2526.4	
4742	6/23/2018 13:05	6		29.27							C	0.15	1292.5	
4743	6/23/2018 13:21	6		30.76		24.29		0.38			U	0.60	1527.5	0.32
4744	6/23/2018 13:38	6		29.54		18.94		0.15			U	0.30	1858.1	0.63
4745	6/23/2018 13:54	6		29.23		26.76					U	0.30	1128.7	0.04
4746	6/23/2018 14:11	6		29.33							U	0.51	1199.8	5.65

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4747	6/23/2018 16:15	6		28.79		22.33		0.38			C	0.17	3118.1	
4748	6/23/2018 16:32	6		28.00				0.27			C	0.07	1166.8	
4749	6/23/2018 16:48	6		25.11							C	0.11	2538.9	
4750	6/23/2018 17:05	6		24.66							C	0.13	1161.5	
4751	6/23/2018 17:21	6		26.04		24.33		0.37			U	0.27	1342.0	0.32
4752	6/23/2018 17:38	6		28.32		18.57		0.18			U	0.19	1498.8	0.22
4753	6/23/2018 17:54	6		29.25		26.78					U	0.23	953.1	0.11
4754	6/23/2018 18:11	6		26.74							U	0.26	998.9	
4755	6/23/2018 20:15	6		21.62		21.13		0.38			C	0.03	1953.0	
4756	6/23/2018 20:32	6		20.61				0.27			C	0.05	949.4	
4757	6/23/2018 20:48	6		20.39							C	0.07	1651.2	
4758	6/23/2018 21:05	6		20.57							C	0.11	1183.8	
4759	6/23/2018 21:21	6		20.45		20.59		0.36			U	0.25	1081.2	0.14
4760	6/23/2018 21:38	6		20.21		14.69		0.05			U	0.42	942.3	
4761	6/23/2018 21:54	6		19.87		22.42					U	0.28	929.7	0.09
4762	6/23/2018 22:11	6		19.42							U	0.26	853.5	
4763	6/24/2018 0:15	6		18.70		20.15		0.38			C	0.09	2225.3	
4764	6/24/2018 0:32	6		18.36				0.27			C	0.05	874.4	
4765	6/24/2018 0:48	6		18.36							C	0.08	1665.7	
4766	6/24/2018 1:05	6		18.37							C	0.11	935.3	
4767	6/24/2018 1:21	6		18.71		18.05		0.36			U	0.09	1092.9	0.04
4768	6/24/2018 1:38	6		18.64		12.35		0.04			U	0.33	971.9	0.09
4769	6/24/2018 1:55	6		18.40		20.06					U	0.21	736.7	0.09
4770	6/24/2018 2:11	6		18.05							U	0.35	815.3	
4771	6/24/2018 4:15	6		18.60		19.48		0.38			C	0.11	2131.1	
4772	6/24/2018 4:32	6		18.58				0.28			C	0.04	804.1	
4773	6/24/2018 4:48	6		18.72							C	0.01	1682.3	
4774	6/24/2018 5:05	6		18.65							C	0.07	887.6	
4775	6/24/2018 5:21	6		18.63		17.49		0.36			U	0.25	1050.7	0.01
4776	6/24/2018 5:38	6		18.50		11.86		0.03			U	0.24	854.3	0.09
4777	6/24/2018 5:55	6		18.27		19.49					U	0.28	637.3	0.08
4778	6/24/2018 6:11	6		18.02							U	0.26	943.1	
4779	6/24/2018 8:15	6		20.18		19.48		0.38			C	0.04	1586.2	
4780	6/24/2018 8:32	6		20.72				0.26			C	0.06	778.8	
4781	6/24/2018 8:48	6		21.92							C	0.04	1586.1	
4782	6/24/2018 9:05	6		24.36							C	0.10	935.2	
4783	6/24/2018 9:21	6		24.35		20.41		0.37			U	0.44	1059.1	0.13
4784	6/24/2018 9:38	6		25.48		15.95		0.03			U	0.33	946.8	0.25
4785	6/24/2018 9:54	6		26.06		23.71					U	0.27	773.5	0.16
4786	6/24/2018 10:11	6		26.92							U	0.43	889.9	
4787	6/24/2018 12:15	6		30.15		21.85		0.38			C	0.04	2381.5	
4788	6/24/2018 12:32	6		30.90				0.27			C	0.08	993.8	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4789	6/24/2018 12:48	6		31.02							C	0.01	2129.6	
4790	6/24/2018 13:05	6		33.30							C	0.09	1091.9	
4791	6/24/2018 13:21	6		34.06	27.99	0.37					U	0.40	1386.0	0.28
4792	6/24/2018 13:38	6		33.79	23.45	0.03					U	0.47	1564.3	0.27
4793	6/24/2018 13:54	6		32.13	30.45						U	0.26	964.3	0.18
4794	6/24/2018 14:11	6		32.24							U	0.52	1097.9	
4795	6/24/2018 16:15	6		29.91	23.69	0.37					C	0.05	3212.5	
4796	6/24/2018 16:32	6		29.69		0.27					C	0.09	1072.6	
4797	6/24/2018 16:48	6		31.05							C	0.04	2010.1	
4798	6/24/2018 17:05	6		33.47							C	0.10	1096.1	
4799	6/24/2018 17:21	6		34.30	28.76	0.36					U	0.34	1308.2	0.26
4800	6/24/2018 17:38	6		34.33	23.61	0.18					U	0.32	1240.0	0.27
4801	6/24/2018 17:54	6		34.47	31.67						U	0.26	970.5	0.12
4802	6/24/2018 18:11	6		29.57							U	0.39	1028.3	
4803	6/24/2018 20:15	6		21.75	22.52	0.37					C	0.04	2215.3	
4804	6/24/2018 20:32	6		21.79		0.27					C	0.07	944.9	
4805	6/24/2018 20:48	6		21.27							C	0.01	1751.0	
4806	6/24/2018 21:05	6		20.83							C	0.13	918.9	
4807	6/24/2018 21:21	6		20.28	22.19	0.35					U	0.20	1123.9	0.03
4808	6/24/2018 21:38	6		20.06	16.49	0.05					U	0.13	959.1	0.01
4809	6/24/2018 21:54	6		20.02	24.07						U	0.26	694.1	0.05
4810	6/24/2018 22:11	6		19.63							U	0.23	761.8	
4811	6/25/2018 0:15	6		18.58	20.72	0.36					C	0.17	1779.8	
4812	6/25/2018 0:32	6		18.70		0.26					C	0.05	831.3	
4813	6/25/2018 0:49	6		18.88							C	0.05	1952.9	
4814	6/25/2018 1:05	6		18.90							C	0.07	844.0	
4815	6/25/2018 1:22	6		18.76	19.17	0.35					U	0.13	972.3	0.01
4816	6/25/2018 1:38	6		18.29	13.66	0.03					U	0.09	770.4	0.07
4817	6/25/2018 1:55	6		18.11	21.33						U	0.10	608.7	0.04
4818	6/25/2018 2:11	6		17.84							U	0.19	719.9	
4819	6/25/2018 4:15	6		16.47	19.71	0.36					C	0.03	1533.1	
4820	6/25/2018 4:32	6		16.33		0.26					C	0.15	699.3	
4821	6/25/2018 4:48	6		16.50							C	0.02	1264.4	
4822	6/25/2018 5:05	6		16.55							C	0.06	715.3	
4823	6/25/2018 5:21	6		16.91	17.34	0.35					U	0.13	966.7	
4824	6/25/2018 5:38	6		16.90	11.88	0.01					U	0.21	805.2	0.04
4825	6/25/2018 5:54	6		16.99	19.60						U	0.08	633.7	0.04
4826	6/25/2018 6:11	6		16.94							U	0.24	656.0	0.10
4827	6/25/2018 8:15	6		19.03	19.36	0.36					C	0.02	1310.1	
4828	6/25/2018 8:32	6		20.29		0.26					C	0.08	715.2	
4829	6/25/2018 8:48	6		20.67							C		1316.4	
4830	6/25/2018 9:05	6		21.43							C	0.09	685.9	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4831	6/25/2018 9:21	6		21.76		18.73		0.35			U	0.17	1072.9	0.03
4832	6/25/2018 9:38	6		21.90		13.48		0.01			U	0.41	1096.3	0.14
4833	6/25/2018 9:54	6		21.07		21.05					U	0.12	726.0	0.04
4834	6/25/2018 10:11	6		19.73							U	0.20	749.9	0.03
4835	6/25/2018 12:15	6		19.13		19.41		0.41			C		99.3	
4836	6/25/2018 12:32	6		20.08				0.38			C		199.3	
4837	6/25/2018 12:48	6		20.76							C	0.07	2051.4	
4838	6/25/2018 13:05	6		20.77							C	0.01	428.9	
4839	6/25/2018 13:21	6		20.91		19.05		0.40			U	0.45	503.0	
4840	6/25/2018 13:38	6		20.67		13.62		0.00			U	0.13	219.1	0.03
4841	6/25/2018 13:55	6		20.52		21.31					U	0.17	141.7	0.03
4842	6/25/2018 14:11	6		20.62							U	0.14	160.3	0.03
4843	6/25/2018 16:15	6		23.64		20.30		0.41			C		540.9	
4844	6/25/2018 16:32	6		23.34				0.35			C	0.19	786.8	
4845	6/25/2018 16:48	6		22.39							C	0.20	1125.6	
4846	6/25/2018 17:05	6		19.66							C	0.05	165.5	
4847	6/25/2018 17:21	6		20.66		19.91		0.41			U	0.92	396.8	
4848	6/25/2018 17:38	6		21.15		14.36		0.01			U	0.27	352.4	0.06
4849	6/25/2018 17:54	6		20.56		22.10					U	0.17	297.9	0.05
4850	6/25/2018 18:11	6		20.99							U	0.17	296.0	
4851	6/25/2018 20:15	6		19.70		20.09		0.41			C	0.03	683.4	
4852	6/25/2018 20:32	6		19.54				0.35			C	0.22	1001.4	
4853	6/25/2018 20:48	6		19.15							C	0.19	1388.0	
4854	6/25/2018 21:05	6		18.98							C	0.15	671.8	
4855	6/25/2018 21:21	6		19.00		18.26		0.40			U	2.52	672.5	
4856	6/25/2018 21:38	6		18.88		12.61		0.00			U	0.33	407.5	0.04
4857	6/25/2018 21:55	6		18.80		20.25					U	0.36	410.3	0.01
4858	6/25/2018 22:11	6		18.71							U	0.21	194.8	0.06
4859	6/26/2018 0:15	6		18.65		19.49		0.41			C	0.01	715.1	
4860	6/26/2018 0:32	6		18.49				0.36			C	0.18	1115.8	
4861	6/26/2018 0:48	6		18.41							C	0.65	3507.6	
4862	6/26/2018 1:05	6		18.27							C	0.07	703.1	
4863	6/26/2018 1:22	6		18.40		17.21		0.40			U	0.89	647.1	
4864	6/26/2018 1:38	6		18.31		11.63		-0.02			U	0.25	483.2	0.02
4865	6/26/2018 1:55	6		18.24		19.21					U	0.22	275.3	0.02
4866	6/26/2018 2:11	6		18.27							U	0.16	171.5	0.01
4867	6/26/2018 4:15	6		18.29		19.11		0.41			C	0.04	517.0	
4868	6/26/2018 4:32	6		18.18				0.36			C	0.21	1219.4	
4869	6/26/2018 4:48	6		18.32							C	0.10	1401.6	
4870	6/26/2018 5:05	6		18.15							C	0.10	754.6	
4871	6/26/2018 5:21	6		18.31		16.91		0.40			U	0.84	800.5	
4872	6/26/2018 5:38	6		18.26		11.37		-0.01			U	0.38	646.0	0.03

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4873	6/26/2018 5:55	6	18.22	18.93							U	0.25	494.6	0.02
4874	6/26/2018 6:11	6	18.24								U	0.21	344.0	0.01
4875	6/26/2018 8:15	6	18.63	19.03	0.41						C	0.01	716.0	
4876	6/26/2018 8:32	6	18.78		0.37						C	0.28	1312.3	
4877	6/26/2018 8:48	6	19.36								C	0.45	4706.3	
4878	6/26/2018 9:05	6	19.15								C	0.10	809.1	
4879	6/26/2018 9:21	6	19.33	17.59	0.40						U	1.05	757.2	
4880	6/26/2018 9:38	6	19.71	12.16	-0.01						U	0.45	835.6	0.03
4881	6/26/2018 9:55	6	20.50	19.90							U	0.32	592.3	0.07
4882	6/26/2018 10:11	6	20.32								U	0.32	447.6	0.06
4883	6/26/2018 12:15	6	23.79	19.80	0.41						C	0.06	1390.7	
4884	6/26/2018 12:32	6	23.58		0.34						C	0.22	1384.7	
4885	6/26/2018 12:48	6	24.08								C	0.11	1641.1	
4886	6/26/2018 13:05	6	23.01								C	0.14	910.9	
4887	6/26/2018 13:21	6	22.86	20.46	0.39						U	1.36	1145.6	0.02
4888	6/26/2018 13:38	6	25.01	15.09	0.05						U	1.01	1320.9	0.12
4889	6/26/2018 13:54	6	25.39	22.96							U	0.73	934.2	0.09
4890	6/26/2018 14:11	6	23.69								U	0.25	670.5	0.80
4891	6/26/2018 16:15	6	30.24	21.19	0.41						C	0.12	3306.7	
4892	6/26/2018 16:32	6	29.52		0.33						C	0.50	1746.0	1.67
4893	6/26/2018 16:48	6	29.88								C	0.26	2346.7	
4894	6/26/2018 17:05	6	30.70								C	0.25	1288.5	1.99
4895	6/26/2018 17:21	6	28.96	24.41	0.39						U	2.28	1741.3	0.11
4896	6/26/2018 17:38	6	27.39	18.39	0.09						U	1.64	1458.9	0.11
4897	6/26/2018 17:55	6	28.69	26.23							U	1.05	1224.2	0.12
4898	6/26/2018 18:11	6	27.04								U	1.26	1105.9	0.29
4899	6/26/2018 20:15	6	22.65	21.58	0.41						C	0.06	1386.5	
4900	6/26/2018 20:32	6	22.72		0.32						C	0.28	1444.4	
4901	6/26/2018 20:48	6	21.19								C	0.10	1723.7	
4902	6/26/2018 21:05	6	20.30								C	0.32	1187.2	
4903	6/26/2018 21:21	6	20.30	20.57	0.39						U	0.85	1177.6	0.01
4904	6/26/2018 21:38	6	20.45	14.59	0.01						U	0.96	938.8	0.12
4905	6/26/2018 21:54	6	20.02	22.41							U	0.64	858.4	0.05
4906	6/26/2018 22:11	6	19.33								U	1.12	812.7	0.01
4907	6/27/2018 0:15	6	17.03	20.16	0.40						C	0.16	1250.8	
4908	6/27/2018 0:32	6	17.07		0.31						C	0.17	933.5	
4909	6/27/2018 0:49	6	17.36								C	0.14	1446.2	
4910	6/27/2018 1:05	6	16.45								C	0.16	953.8	
4911	6/27/2018 1:22	6	16.34	17.42	0.38						U	0.60	928.2	0.01
4912	6/27/2018 1:38	6	16.19	11.61	-0.01						U	0.61	714.8	0.02
4913	6/27/2018 1:54	6	16.16	19.42							U	0.50	671.4	0.05
4914	6/27/2018 2:11	6	16.00								U	0.43	607.5	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4915	6/27/2018 4:15	6		15.82		19.06		0.40			C	0.12	1259.6	
4916	6/27/2018 4:32	6		15.83				0.31			C	0.18	1132.3	
4917	6/27/2018 4:48	6		16.52							C	0.13	1426.1	
4918	6/27/2018 5:05	6		16.08							C	0.13	822.7	
4919	6/27/2018 5:21	6		16.37		16.22		0.38			U	0.52	938.3	
4920	6/27/2018 5:38	6		16.31		10.53		-0.01			U	0.54	643.4	0.03
4921	6/27/2018 5:54	6		16.43		18.31					U	0.35	582.5	0.07
4922	6/27/2018 6:11	6		16.46							U	0.46	633.9	0.11
4923	6/27/2018 8:15	6		17.67		18.83		0.40			C	0.82	4404.2	
4924	6/27/2018 8:32	6		17.98				0.33			C	0.28	1630.5	
4925	6/27/2018 8:48	6		18.58							C	0.09	1506.1	
4926	6/27/2018 9:05	6		19.11							C	0.11	873.1	
4927	6/27/2018 9:21	6		19.74		17.10		0.39			U	0.49	856.7	
4928	6/27/2018 9:38	6		20.09		11.72		0.03			U	0.77	849.8	0.04
4929	6/27/2018 9:54	6		20.04		19.41					U	0.39	506.8	0.06
4930	6/27/2018 10:11	6		20.34							U	0.50	670.5	0.03
4931	6/27/2018 12:15	6		29.63		20.25		0.41			C	0.13	1997.2	
4932	6/27/2018 12:32	6		28.21				0.32			C	0.34	1461.8	3.01
4933	6/27/2018 12:48	6		30.18							C	0.13	2235.9	
4934	6/27/2018 13:05	6		30.02							C	0.23	1406.7	2.24
4935	6/27/2018 13:21	6		30.96		24.64		0.39			U	0.99	1268.2	0.06
4936	6/27/2018 13:38	6		31.43		19.58		0.06			U	2.69	1355.6	0.11
4937	6/27/2018 13:55	6		31.36		25.59					U	0.89	1393.6	0.12
4938	6/27/2018 14:11	6		32.06							U	1.72	1698.8	0.77
4939	6/27/2018 16:15	6		34.76		23.81		0.40			C	0.13	3706.3	
4940	6/27/2018 16:32	6		34.45				0.31			C	0.16	1510.2	
4941	6/27/2018 16:48	6		35.04							C	0.09	2694.7	
4942	6/27/2018 17:05	6		33.65							C	0.16	1579.7	
4943	6/27/2018 17:21	6		33.53		27.97		0.38			U	0.94	1352.3	0.11
4944	6/27/2018 17:38	6		33.33		21.83		0.06			U	0.89	1667.9	0.35
4945	6/27/2018 17:54	6		34.68		28.92					U	0.64	1193.6	0.04
4946	6/27/2018 18:11	6		33.49							U	1.49	1443.2	3.87
4947	6/27/2018 20:15	6		24.95		23.21		0.40			C	0.19	2222.6	
4948	6/27/2018 20:32	6		25.80				0.29			C	0.12	1245.3	
4949	6/27/2018 20:48	6		24.47							C	0.06	1852.8	
4950	6/27/2018 21:05	6		24.48							C	0.12	1248.1	
4951	6/27/2018 21:21	6		23.26		23.13		0.37			U	0.55	1252.7	0.04
4952	6/27/2018 21:38	6		22.67		16.72		-0.01			U	0.53	1121.2	
4953	6/27/2018 21:54	6		22.18		24.25					U	0.45	917.5	0.01
4954	6/27/2018 22:11	6		21.56							U	0.54	1120.0	
4955	6/28/2018 0:15	6		20.96		21.77		0.40			C	0.17	2443.9	
4956	6/28/2018 0:32	6		20.84				0.29			C	0.12	1101.8	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4957	6/28/2018 0:48	6		20.84							C	0.07	1839.2	
4958	6/28/2018 1:05	6		20.82							C	0.10	1160.8	
4959	6/28/2018 1:21	6		21.18	20.17	0.37					U	0.37	1137.6	0.01
4960	6/28/2018 1:38	6		20.94	14.27	-0.01					U	0.69	887.1	0.06
4961	6/28/2018 1:54	6		20.66	21.95						U	0.36	823.3	0.05
4962	6/28/2018 2:11	6		19.95							U	0.53	995.9	
4963	6/28/2018 4:15	6		18.29	20.96	0.40					C	0.17	1934.8	
4964	6/28/2018 4:32	6		17.95		0.29					C	0.13	887.6	
4965	6/28/2018 4:48	6		18.46							C	0.05	1563.8	
4966	6/28/2018 5:05	6		17.95							C	0.11	983.0	
4967	6/28/2018 5:21	6		17.56	18.23	0.37					U	0.36	987.1	0.02
4968	6/28/2018 5:38	6		17.32	12.38	-0.04					U	0.47	815.9	0.02
4969	6/28/2018 5:54	6		17.76	20.11						U	0.29	874.0	0.02
4970	6/28/2018 6:11	6		17.64							U	0.83	973.3	0.13
4971	6/28/2018 8:15	6		21.28	20.48	0.40					C	0.14	2097.8	
4972	6/28/2018 8:32	6		23.21		0.29					C	0.12	1053.5	0.01
4973	6/28/2018 8:48	6		23.01							C	0.07	1866.6	
4974	6/28/2018 9:05	6		24.69							C	0.11	1088.3	
4975	6/28/2018 9:21	6		25.06	21.00	0.37					U	0.42	1250.3	0.01
4976	6/28/2018 9:38	6		26.79	16.44	-0.01					U	0.44	1072.0	0.07
4977	6/28/2018 9:54	6		27.00	23.93						U	0.42	885.7	0.09
4978	6/28/2018 10:11	6		27.05							U	0.76	1083.6	0.28
4979	6/28/2018 12:15	6		28.46	22.58	0.40					C	0.23	2607.8	
4980	6/28/2018 12:32	6		27.15		0.29					C	0.12	1188.9	
4981	6/28/2018 12:48	6		26.02							C		1633.8	
4982	6/28/2018 13:05	6		26.71							C	0.09	1111.4	
4983	6/28/2018 13:21	6		25.61	23.41	0.37					U	0.63	2026.5	
4984	6/28/2018 13:38	6		25.81	17.38	-0.03					U	0.78	1595.0	0.10
4985	6/28/2018 13:54	6		27.15	25.08						U	0.41	1017.1	0.01
4986	6/28/2018 14:11	6		27.15							U	0.78	1023.0	0.42
4987	6/28/2018 16:15	6		28.82	23.34	0.40					C	0.32	2190.1	
4988	6/28/2018 16:32	6		28.61		0.28					C	0.13	1529.5	
4989	6/28/2018 16:48	6		30.02							C		1799.7	
4990	6/28/2018 17:05	6		33.55							C	0.13	1268.2	
4991	6/28/2018 17:21	6		31.11	26.31	0.36					U	0.58	2021.8	0.02
4992	6/28/2018 17:38	6		27.75	19.90	-0.03					U	0.49	1156.5	0.04
4993	6/28/2018 17:54	6		28.74	26.99						U	0.66	1042.9	0.03
4994	6/28/2018 18:11	6		29.32							U	0.61	1186.5	0.07
4995	6/28/2018 20:15	6		25.76	23.19	0.39					C	0.28	2058.5	
4996	6/28/2018 20:32	6		27.06		0.28					C	0.12	1212.1	
4997	6/28/2018 20:48	6		25.17							C		1770.8	
4998	6/28/2018 21:05	6		24.90							C	0.06	1096.7	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
4999	6/28/2018 21:21	6		23.85		22.88		0.36			U	0.40	1498.8	
5000	6/28/2018 21:38	6		23.60		16.77		-0.04			U	0.44	1325.8	0.04
5001	6/28/2018 21:55	6		23.37		24.40					U	0.32	920.9	0.02
5002	6/28/2018 22:11	6		22.99							U	0.50	1007.6	0.57
5003	6/29/2018 0:15	6		22.43		22.37		0.39			C	0.20	1832.5	
5004	6/29/2018 0:32	6		22.50				0.27			C	0.14	1264.4	
5005	6/29/2018 0:49	6		22.36							C		1655.1	
5006	6/29/2018 1:05	6		22.42							C	0.07	1074.7	
5007	6/29/2018 1:22	6		22.73		20.80		0.36			U	0.36	1633.1	
5008	6/29/2018 1:38	6		22.96		15.03		-0.04			U	0.27	1487.9	0.01
5009	6/29/2018 1:55	6		22.91		22.78					U	0.34	950.8	0.02
5010	6/29/2018 2:11	6		22.61							U	0.39	971.5	0.01
5011	6/29/2018 4:15	6		22.59		21.97		0.39			C	0.12	2787.5	
5012	6/29/2018 4:32	6		22.61				0.27			C	0.17	1647.5	
5013	6/29/2018 4:48	6		22.59							C	0.03	1684.9	
5014	6/29/2018 5:05	6		22.55							C	0.07	1084.6	
5015	6/29/2018 5:21	6		22.64		20.31		0.36			U	0.39	1498.5	
5016	6/29/2018 5:38	6		22.79		14.62		-0.04			U	0.21	1224.3	0.01
5017	6/29/2018 5:54	6		22.86		22.27					U	0.29	883.5	0.01
5018	6/29/2018 6:11	6		22.80							U	0.44	978.4	0.02
5019	6/29/2018 8:15	6		24.26		21.89		0.39			C	0.01	2210.7	
5020	6/29/2018 8:32	6		25.59				0.27			C	0.12	1244.9	
5021	6/29/2018 8:48	6		25.58							C		1474.1	
5022	6/29/2018 9:05	6		27.04							C	0.08	1079.2	
5023	6/29/2018 9:21	6		27.65		22.31		0.36			U	0.34	1171.3	
5024	6/29/2018 9:38	6		28.80		17.79		-0.01			U	0.14	832.3	0.05
5025	6/29/2018 9:54	6		29.20		25.00					U	0.61	707.9	0.06
5026	6/29/2018 10:11	6		29.70							U	0.50	983.1	0.13
5027	6/29/2018 12:15	6		33.34		23.79		0.39			C		3024.4	
5028	6/29/2018 12:32	6		34.61				0.28			C	0.21	1463.2	
5029	6/29/2018 12:48	6		34.87							C		1763.7	
5030	6/29/2018 13:05	6		35.37							C	0.10	1102.3	
5031	6/29/2018 13:21	6		36.05		29.71		0.36			U	0.48	668.1	1.05
5032	6/29/2018 13:38	6		36.25		25.60		-0.01			U	0.13	802.2	0.05
5033	6/29/2018 13:54	6		36.66		31.52					U	0.24	788.8	0.03
5034	6/29/2018 14:11	6		36.33							U	0.41	1089.2	0.09
5035	6/29/2018 16:15	6		34.50		25.53		0.38			C		2703.3	
5036	6/29/2018 16:32	6		36.22				0.27			C	0.07	1190.0	
5037	6/29/2018 16:48	6		35.03							C		1565.8	
5038	6/29/2018 17:05	6		35.82							C	0.09	1001.2	
5039	6/29/2018 17:21	6		35.03		30.86		0.36			U	0.58	467.7	
5040	6/29/2018 17:38	6		34.18		25.60		-0.02			U	0.23	536.7	0.03

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
5041	6/29/2018 17:54	6	33.87	32.12			U	0.22	681.4	0.01
5042	6/29/2018 18:11	6	33.27				U	0.27	966.1	0.04
5043	6/29/2018 20:15	6	28.50	24.95	0.38		C		2307.4	
5044	6/29/2018 20:32	6	29.12		0.27		C	0.09	992.1	
5045	6/29/2018 20:48	6	27.43				C		1717.8	
5046	6/29/2018 21:05	6	27.78				C		1104.4	
5047	6/29/2018 21:21	6	26.81	26.27	0.35		U	0.51	828.1	0.01
5048	6/29/2018 21:38	6	26.34	20.76	-0.04		U	0.33	741.1	0.01
5049	6/29/2018 21:54	6	26.22	28.00			U	0.25	739.7	0.03
5050	6/29/2018 22:11	6	25.96				U	0.30	1012.8	
5051	6/30/2018 0:15	6	24.66	23.99	0.37		C	0.04	2323.5	
5052	6/30/2018 0:32	6	24.59		0.26		C	0.12	838.0	
5053	6/30/2018 0:48	6	23.64				C		1525.9	
5054	6/30/2018 1:05	6	23.52				C	0.03	836.9	
5055	6/30/2018 1:21	6	22.94	23.16	0.35		U	0.92	780.5	
5056	6/30/2018 1:38	6	22.84	17.61	-0.04		U	0.17	972.0	0.01
5057	6/30/2018 1:54	6	22.29	24.97			U	0.12	610.8	0.01
5058	6/30/2018 2:11	6	21.73				U	0.30	961.1	0.05
5059	6/30/2018 4:15	6	20.09	22.71	0.37		C	0.05	1887.4	
5060	6/30/2018 4:32	6	20.18		0.26		C	0.04	834.5	
5061	6/30/2018 4:48	6	20.19				C	0.04	1543.1	
5062	6/30/2018 5:05	6	20.21				C	0.08	809.2	
5063	6/30/2018 5:21	6	20.40	20.74	0.34		U	0.15	819.8	
5064	6/30/2018 5:38	6	20.36	15.28	-0.04		U	0.17	670.0	
5065	6/30/2018 5:54	6	20.43	22.98			U	0.17	626.3	0.01
5066	6/30/2018 6:11	6	20.41				U	0.28	775.7	0.01
5067	6/30/2018 8:15	6	21.22	22.05	0.37		C	0.01	1891.3	
5068	6/30/2018 8:32	6	22.11		0.26		C	0.05	785.4	
5069	6/30/2018 8:48	6	23.82				C		1550.3	
5070	6/30/2018 9:05	6	24.39				C	0.05	769.3	0.02
5071	6/30/2018 9:21	6	24.67	21.72	0.35		U	0.38	736.9	
5072	6/30/2018 9:38	6	24.42	16.63	-0.04		U	0.17	553.4	0.03
5073	6/30/2018 9:55	6	22.69	23.48			U	0.18	426.8	0.02
5074	6/30/2018 10:11	6	21.90				U	0.25	639.0	0.03
5075	6/30/2018 12:15	6	22.14	21.96	0.37		C	0.03	1931.2	
5076	6/30/2018 12:32	6	21.83		0.26		C	0.04	620.9	0.21
5077	6/30/2018 12:48	6	20.22				C	0.02	1380.5	
5078	6/30/2018 13:05	6	20.13				C	0.08	1061.5	
5079	6/30/2018 13:21	6	21.26	20.83	0.35		U	0.71	691.6	
5080	6/30/2018 13:38	6	24.62	15.93	-0.04		U	0.57	1095.6	
5081	6/30/2018 13:54	6	26.86	24.32			U	0.51	968.8	0.01
5082	6/30/2018 14:11	6	25.64				U	0.54	867.3	0.04

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
5083	6/30/2018 16:15	6	26.42	23.20	0.37						C	0.02	2296.6	
5084	6/30/2018 16:32	6	26.56		0.26						C	0.12	899.9	
5085	6/30/2018 16:48	6	24.67								C	0.01	1600.9	
5086	6/30/2018 17:05	6	25.44								C	0.05	861.6	
5087	6/30/2018 17:21	6	25.43	23.98	0.35						U	0.41	800.9	
5088	6/30/2018 17:38	6	24.77	18.44	-0.04						U	0.50	671.2	0.04
5089	6/30/2018 17:54	6	23.26	25.22							U	0.18	588.1	0.03
5090	6/30/2018 18:11	6	22.30								U	0.47	701.4	0.01
5091	6/30/2018 20:15	6	20.21	22.04	0.38						C	0.08	1863.8	
5092	6/30/2018 20:32	6	20.12		0.28						C	0.07	1073.5	
5093	6/30/2018 20:48	6	20.31								C	0.04	2248.1	
5094	6/30/2018 21:05	6	20.17								C	0.07	1067.6	
5095	6/30/2018 21:21	6	20.21	20.28	0.35						U	0.59	916.6	
5096	6/30/2018 21:38	6	20.08	14.73	-0.04						U	0.48	795.0	
5097	6/30/2018 21:54	6	20.01	22.32							U	0.33	796.6	
5098	6/30/2018 22:11	6	19.97								U	0.54	888.1	
5099	7/1/2018 0:15	6	20.00	21.43	0.40						C	0.02	557.2	
5100	7/1/2018 0:32	6	19.66		0.35						C	0.10	530.0	
5101	7/1/2018 0:49	6	19.76								C	0.14	2110.6	
5102	7/1/2018 1:05	6	19.64								C	0.02	297.0	
5103	7/1/2018 1:22	6	19.64	19.06	0.40						U	0.48	284.4	
5104	7/1/2018 1:38	6	19.41	13.47	-0.04						U	0.21	158.8	
5105	7/1/2018 1:55	6	19.33	21.09							U	0.21	225.7	
5106	7/1/2018 2:11	6	19.35								U	0.23	113.6	
5107	7/1/2018 4:15	6	18.89	20.79	0.41						C		607.6	
5108	7/1/2018 4:32	6	18.42		0.36						C	0.07	118.3	
5109	7/1/2018 4:48	6	18.74								C	0.24	4734.2	
5110	7/1/2018 5:05	6	18.58								C	0.04	348.6	
5111	7/1/2018 5:21	6	18.63	18.02	0.41						U	1.19	203.2	
5112	7/1/2018 5:38	6	18.40	12.48	0.36						U	0.20	158.3	
5113	7/1/2018 5:55	6	18.08	20.07							U	0.04	69.6	
5114	7/1/2018 6:11	6	18.02								U	0.35	38.1	
5115	7/1/2018 8:15	6	16.70	19.53	0.42						C	0.01	368.2	0.42
5116	7/1/2018 8:32	6	16.17		0.37						C	0.05	124.3	
5117	7/1/2018 8:48	6	16.90								C	0.37	4320.3	
5118	7/1/2018 9:05	6	16.91								C	0.02	223.1	
5119	7/1/2018 9:22	6	17.42	16.65	0.41						U	0.97	285.8	
5120	7/1/2018 9:38	6	17.94	11.44	0.92						U	0.13	167.1	
5121	7/1/2018 9:55	6	19.49	19.20							U	0.41	269.0	
5122	7/1/2018 10:11	6	21.18								U	0.67	438.0	0.01
5123	7/1/2018 12:15	6	27.42	20.90	0.41						C	0.06	1969.3	
5124	7/1/2018 12:32	6	25.95		0.35						C	0.20	1027.3	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
5125	7/1/2018 12:48	6		29.69							C	0.71	2282.4	
5126	7/1/2018 13:05	6		27.92							C	0.16	761.1	0.01
5127	7/1/2018 13:21	6		28.90	25.57	0.39					U	2.11	1067.3	
5128	7/1/2018 13:38	6		28.38	20.23	0.68					U	1.55	775.2	0.07
5129	7/1/2018 13:54	6		29.15	25.93						U	1.90	1112.1	0.02
5130	7/1/2018 14:11	6		30.31							U	2.44	1298.6	0.07
5131	7/1/2018 16:15	6		26.97	23.55	0.41					C	0.02	2315.5	
5132	7/1/2018 16:32	6		27.06		0.33					C	0.19	1331.1	
5133	7/1/2018 16:48	6		25.11							C	0.33	2241.2	
5134	7/1/2018 17:05	6		23.44							C	0.08	1132.6	
5135	7/1/2018 17:21	6		23.14	24.00	0.38					U	0.78	986.7	
5136	7/1/2018 17:38	6		23.23	18.09	0.52					U	0.49	570.6	
5137	7/1/2018 17:54	6		26.36	25.05						U	0.66	1037.2	0.01
5138	7/1/2018 18:11	6		28.21							U	0.92	1044.4	0.05
5139	7/1/2018 20:15	6		22.93	22.45	0.41					C		1511.7	
5140	7/1/2018 20:32	6		24.49		0.32					C	0.11	1126.0	
5141	7/1/2018 20:48	6		21.90							C	0.14	1680.1	
5142	7/1/2018 21:05	6		21.98							C	0.15	1022.6	
5143	7/1/2018 21:21	6		20.12	21.11	0.38					U	0.62	877.1	
5144	7/1/2018 21:38	6		19.41	15.42	0.34					U	0.42	639.7	
5145	7/1/2018 21:54	6		19.09	22.95						U	0.56	782.8	
5146	7/1/2018 22:11	6		18.56							U	0.55	839.1	
5147	7/2/2018 0:15	6		17.90	21.14	0.41					C	0.03	1278.6	
5148	7/2/2018 0:32	6		17.38		0.32					C	0.12	928.3	
5149	7/2/2018 0:49	6		17.50							C		1463.4	
5150	7/2/2018 1:05	6		17.03							C	0.13	864.1	
5151	7/2/2018 1:22	6		17.11	17.79	0.38					U	0.56	744.9	
5152	7/2/2018 1:38	6		16.81	12.11	0.33					U	0.28	532.8	
5153	7/2/2018 1:55	6		16.75	20.05						U	0.44	654.1	
5154	7/2/2018 2:11	6		16.62							U	0.39	664.4	
5155	7/2/2018 4:15	6		16.49	20.12	0.41					C		1101.7	
5156	7/2/2018 4:32	6		16.20		0.33					C	0.09	885.1	
5157	7/2/2018 4:48	6		16.21							C	0.05	1391.7	
5158	7/2/2018 5:05	6		15.36							C	0.07	779.8	
5159	7/2/2018 5:21	6		15.39	16.23	0.38					U	0.42	722.0	
5160	7/2/2018 5:38	6		14.98	10.56	0.31					U	0.27	552.8	
5161	7/2/2018 5:54	6		14.85	18.53						U	0.33	565.2	0.06
5162	7/2/2018 6:11	6		14.73							U	0.42	624.8	0.01
5163	7/2/2018 8:15	6		18.63	19.65	0.41					C		1067.6	0.14
5164	7/2/2018 8:32	6		20.33		0.33					C	0.10	894.4	0.01
5165	7/2/2018 8:48	6		20.36							C	0.01	1386.6	
5166	7/2/2018 9:05	6		21.67							C	0.12	923.4	

ID #	Date & Time	Run	A	Tmp	S	Tmp	N	Mst	NS	Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
5167	7/2/2018 9:21	6		22.36		19.05		0.38			U	0.46	945.7	
5168	7/2/2018 9:38	6		23.04		14.35		0.30			U	0.21	542.9	0.02
5169	7/2/2018 9:55	6		24.80		21.73					U	0.46	677.2	0.02
5170	7/2/2018 10:11	6		24.98							U	0.61	684.9	0.01
5171	7/2/2018 12:15	6		28.67		21.54		0.41			C	0.01	1865.8	
5172	7/2/2018 12:32	6		29.11				0.32			C	0.11	1401.2	
5173	7/2/2018 12:48	6		29.46							C		1736.1	
5174	7/2/2018 13:05	6		30.54							C	0.11	1353.1	0.20
5175	7/2/2018 13:21	6		30.67		25.06		0.38			U	0.57	1302.9	
5176	7/2/2018 13:38	6		30.06		19.68		0.33			U	0.45	1306.6	0.02
5177	7/2/2018 13:54	6		30.67		27.12					U	0.61	1181.4	0.07
5178	7/2/2018 14:11	6		30.69							U	1.16	1256.9	0.02
5179	7/2/2018 16:15	6		30.21		23.37		0.40			C	0.06	3107.8	
5180	7/2/2018 16:32	6		30.85				0.31			C	0.25	1537.3	
5181	7/2/2018 16:48	6		30.86							C	0.03	1716.3	
5182	7/2/2018 17:05	6		31.99							C	0.11	1433.8	
5183	7/2/2018 17:21	6		31.19		27.05		0.37			U	0.51	1392.0	
5184	7/2/2018 17:38	6		29.39		19.94		0.38			U	0.23	1101.9	0.01
5185	7/2/2018 17:55	6		29.15		26.93					U	0.56	1008.2	0.01
5186	7/2/2018 18:11	6		27.77							U	0.63	910.5	0.04
5187	7/2/2018 20:15	6		24.38		22.62		0.40			C	0.02	2697.3	
5188	7/2/2018 20:32	6		24.52				0.30			C	0.13	1103.4	
5189	7/2/2018 20:48	6		24.04							C	0.03	1483.1	
5190	7/2/2018 21:05	6		24.07							C	0.07	1045.0	
5191	7/2/2018 21:21	6		23.74		22.40		0.37			U	0.13	1243.6	
5192	7/2/2018 21:38	6		23.36		15.95		0.28			U	0.32	1059.6	
5193	7/2/2018 21:54	6		23.20		23.43					U	0.36	878.1	
5194	7/2/2018 22:11	6		23.09							U	0.45	772.9	0.01
5195	7/3/2018 0:15	6		21.94		21.72		0.40			C	0.02	2595.4	
5196	7/3/2018 0:32	6		22.11				0.30			C	0.10	1205.7	
5197	7/3/2018 0:49	6		22.35							C		1400.7	
5198	7/3/2018 1:05	6		23.27							C	0.05	923.3	
5199	7/3/2018 1:22	6		23.04		20.56		0.37			U	0.34	865.5	0.12
5200	7/3/2018 1:38	6		22.50		14.51		0.27			U	0.41	709.3	0.01
5201	7/3/2018 1:55	6		22.25		22.19					U	0.31	715.0	0.01
5202	7/3/2018 2:11	6		22.29							U	0.58	841.9	0.02
5203	7/3/2018 4:15	6		19.68		21.11		0.40			C		1669.3	
5204	7/3/2018 4:32	6		19.58				0.31			C	0.09	277.3	
5205	7/3/2018 4:48	6		20.00							C	0.05	1876.3	
5206	7/3/2018 5:05	6		20.01							C	0.04	586.4	
5207	7/3/2018 5:21	6		20.34		19.21		0.37			U	0.45	704.8	
5208	7/3/2018 5:38	6		19.92		13.34		0.23			U	0.28	356.4	

ID #	Date & Time	Run	A Tmp	S Tmp	N Mst	NS Mst	Trt	N ₂ O-N	CO ₂ -C	NH ₃ -N
5209	7/3/2018 5:54	6	19.58	20.93			U	0.15	121.1	
5210	7/3/2018 6:11	6	19.37				U	0.14	183.4	
5211	7/3/2018 8:15	6	18.78	20.48	0.41		C		580.2	
5212	7/3/2018 8:32	6	18.68		0.37		C	0.07	497.7	
5213	7/3/2018 8:48	6	18.91				C	0.23	3002.4	
5214	7/3/2018 9:05	6	18.72				C	0.08	477.1	
5215	7/3/2018 9:21	6	19.16	18.12	0.40		U	0.82	1621.9	
5216	7/3/2018 9:38	6	19.76	12.48	0.58		U	0.35	1654.5	
5217	7/3/2018 9:55	6	21.13	20.50			U	1.41	766.6	
5218	7/3/2018 10:11	6	21.23				U	1.18	332.0	